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Part III

Department of Homeland Security

Coast Guard

33 CFR Parts 154, 155, and 156

46 CFR Parts 35 and 39

Marine Vapor Control Systems; Proposed Rule

DEPARTMENT OF HOMELAND SECURITY

Coast Guard

33 CFR Parts 154, 155, and 156

46 CFR Parts 35 and 39

[USCG–1999–5150]

RIN 1625–AB37

Marine Vapor Control Systems

AGENCY: Coast Guard, DHS.

ACTION: Notice of proposed rulemaking.

SUMMARY: The Coast Guard proposes to increase maritime domain safety by revising existing safety regulations for facility and vessel vapor control systems (VCSs). The proposed changes would make VCS requirements more compatible with new Federal and State environmental requirements, reflect industry advancements in VCS technology, and codify the standards for the design and operation of a VCS at tank barge cleaning facilities. These changes would increase the safety of operations by regulating the design, installation, and use of VCSs, but would not require anyone to install or use VCSs.

DATES: Comments and related material must either be submitted to our online docket via *http://www.regulations.gov* on or before April 21, 2011 or reach the Docket Management Facility by that date. Comments sent to the Office of Management and Budget (OMB) on collection of information must reach OMB on or before April 21, 2011.

ADDRESSES: You may submit comments identified by docket number USCG–1999–5150 using any one of the following methods:

(1) *Federal eRulemaking Portal: http://www.regulations.gov.*

(2) *Fax:* 202–493–2251.

(3) *Mail:* Docket Management Facility (M–30), U.S. Department of Transportation, West Building Ground Floor, Room W12–140, 1200 New Jersey Avenue, SE., Washington, DC 20590–0001.

(4) *Hand delivery:* Same as mail address above, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The telephone number is 202–366–9329.

To avoid duplication, please use only one of these four methods. *See* the "Public Participation and Request for Comments" portion of the **SUPPLEMENTARY INFORMATION** section below for instructions on submitting comments.

Collection of Information Comments: If you have comments on the collection of information discussed in section VI.D. of this notice of proposed rulemaking (NPRM), you must also send comments to the Office of Information and Regulatory Affairs (OIRA), Office of Management and Budget. To ensure that your comments to OIRA are received on time, the preferred methods are by e-mail to *oira_submission@omb.eop.gov* (include the docket number and "Attention: Desk Officer for Coast Guard, DHS" in the subject line of the e-mail) or fax at 202–395–6566. An alternate, though slower, method is by U.S. mail to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW., Washington, DC 20503, ATTN: Desk Officer, U.S. Coast Guard.

Viewing Incorporation by Reference Material: You may inspect the material proposed for incorporation by reference at room 1214, U.S. Coast Guard Headquarters, 2100 Second Street, SW., Washington, DC 20593–0001 between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. The telephone number is 202–372–1422. Copies of the material are available as indicated in the "Incorporation by Reference" section of this preamble.

FOR FURTHER INFORMATION CONTACT: If you have questions on this proposed rule, call or e-mail Ms. Sara Ju, Office of Operating and Environmental Standards, U.S. Coast Guard; telephone 202–372–1422, e-mail *Sara.S.Ju@uscg.mil.* If you have questions on viewing or submitting material to the docket, call Renee V. Wright, Program Manager, Docket Operations, telephone 202–366–9826.

SUPPLEMENTARY INFORMATION:

Table of Contents for Preamble

I. Public Participation and Request for Comments

We encourage you to participate in this rulemaking by submitting comments and related materials. All comments received will be posted without change to *http://www.regulations.gov* and will include any personal information you have provided.

A. Submitting Comments

If you submit a comment, please include the docket number for this rulemaking (USCG–1999–5150), indicate the specific section of this document to which each comment applies, and provide a reason for each suggestion or recommendation. You may submit your comments and material online or by fax, mail, or hand delivery, but please use only one of these means. We recommend that you include your name and a mailing address, an e-mail address, or a phone number in the body of your document so that we can contact you if we have questions regarding your submission.

To submit your comment online, go to *http://www.regulations.gov,* click on the "submit a comment" box, which will then become highlighted in blue. In the "Document Type" drop down menu select "Proposed Rule" and insert "USCG–1999–5150" in the "Keyword" box. Click "Search" then click on the balloon shape in the "Actions" column. If you submit your comments by mail or hand delivery, submit them in an unbound format, no larger than 8½; by 11 inches, suitable for copying and electronic filing. If you submit comments by mail and would like to know that they have reached the Facility, please enclose a stamped, self-addressed postcard or envelope.

We will consider all comments and material received during the comment period and may change this proposed rule based on your comments.

B. Viewing Comments and Documents

To view comments, as well as documents mentioned in this preamble as being available in the docket, go to *http://www.regulations.gov,* click on the "read comments" box, which will then become highlighted in blue. In the "Keyword" box insert "USCG–1999–5150" and click "Search." Click the "Open Docket Folder" in the "Actions" column. If you do not have access to the Internet, you may view the docket online by visiting the Docket Management Facility in Room W12–140 on the ground floor of the Department of Transportation West Building, 1200 New Jersey Avenue, SE., Washington,

DC 20590, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. We have an agreement with the Department of Transportation to use the Docket Management Facility.

C. Privacy Act

Anyone can search the electronic form of comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, *etc.*). You may review a Privacy Act notice regarding our public dockets in the January 17, 2008 issue of the **Federal Register** (73 FR 3316).

D. Public Meeting

We do not now plan to hold a public meeting. But you may submit a request for one to the docket using one of the methods specified under **ADDRESSES**. In your request, explain why you believe a public meeting would be beneficial. If we determine that one would aid this rulemaking, we will hold one at a time and place announced by a later notice in the **Federal Register**.

II. Abbreviations

ANSI American National Standards Institute
API American Petroleum Institute
ASTM American Society for Testing and Materials
CAA 90 U.S. Clean Air Act Amendments of 1990
CTAC Chemical Transportation Advisory Committee
DHS Department of Homeland Security
DOT Department of Transportation
EPA U.S. Environmental Protection Agency
HAP Hazardous air pollutant
IEC International Electrotechnical Commission
IMO International Maritime Organization
ISA International Standards Association
ISGOTT International Safety Guide for Oil Tankers and Terminals
MAWP Maximum allowable working pressure
MESG Maximum experimental safe gap
MISL Marine Information for Safety and Law Enforcement
MOCC Minimum oxygen concentration for combustion
MSC Coast Guard Marine Safety Center
NAICS North American Industry Classification System
NEPA National Environmental Policy Act of 1969
NFPA National Fire Protection Association
NPRM Notice of proposed rulemaking
NTTAA The National Technology Transfer and Advancement Act
NVIC Navigation and Vessel Inspection Circular
OCIMF Oil Companies International Marine Forum
OMB Office of Management and Budget
P&IDs Piping and instrumentation diagrams
PIC Person-in-charge
PPM Parts per million
psi Pounds per square inch
psia Pounds per square inch absolute
psig Pounds per square inch gauge
QDC Quick disconnect couplings
SIC Standard Industrial Classification
UFL Upper flammable limit
USCG U.S. Coast Guard
VCS Vapor control system
VOC Volatile organic compound

III. Basis and Purpose

This NPRM proposes amendments to 1990 Coast Guard regulations (final rule, 55 FR 25396; June 21, 1990) relating to facility and vessel vapor control systems (VCSs), and generally appearing in 33 CFR part 154, subpart E and in 46 CFR part 39. These regulations do not require any facility or vessel to control vapor or be equipped with a VCS, nor do they require a vessel to take away vapor from facilities. Instead, these regulations would apply to facilities and vessels that voluntarily engage in vapor control activities or that do so in compliance with other regulatory requirements imposed by the Federal Government or by the States. Our regulatory authority is delegated to the Coast Guard by the Secretary of Homeland Security, and derives from 42 U.S.C. 7511b(f)(2), 33 U.S.C. 1231, and 46 U.S.C. 3703. Section 7511b(f)(2) of Title 42 U.S.C. was enacted by the Clean Air Act Amendments of 1990 (CAA 90), and directs the Secretary to issue regulations ensuring the safety of equipment and operations used to control vapor emissions. Section 1231 of Title 33 U.S.C. gives the Secretary authority to issue regulations to implement port and waterways safety statutes. One of those statutes is 33 U.S.C. 1225, which requires the Secretary to act as necessary to prevent damage to land and structures on or along U.S. navigable waters and to protect these navigable waters and their resources. Section 3703 of Title 46 U.S.C. requires the Secretary to regulate vessels and their liquid bulk dangerous cargo operations to protect life, property, and the marine environment.

During marine tank vessel loading and other operations, the liquid loaded into a cargo tank displaces vapors within the tank. Vapors are also generated because of vapor growth. The emitted vapors of certain cargoes contain volatile organic compounds (VOCs) and other air pollutants. CAA 90 requires that these vapors be controlled in air quality non-attainment areas. Under CAA 90, the U.S. Environmental Protection Agency (EPA) issues national standards for control of VOCs and other air pollutants emitted during marine tank vessel operations. CAA 90 also authorizes Federal and State regulations to set vapor emission standards and to require that marine terminals and tank vessels be equipped with VCSs. These systems are used to collect and process vocs and other air pollutants emitted during loading and other operations of marine tank vessels.

Two trends have emerged since we implemented our current VCS regulations. Together, these trends make it advisable for us to amend our regulations.

Improved design and technology: First, VCS design and technology has improved since 1990, and our current regulations do not reflect those improvements. Currently, we accommodate these design and technology improvements by using the exemption and equivalency determination provisions of 33 CFR 154.108 and 46 CFR 30.15–1 to approve individual applications by VCS owners or designers who can show that their improvements provide a level of safety at least equivalent to that provided by our regulations. Reliance on individual exemptions or equivalency determinations involves extra risk for VCS owners and designers, and extra review time for the Coast Guard. We would prefer to reduce the need for individual exemptions and equivalency determinations, and therefore reduce Coast Guard administrative work, by updating our regulations to reflect more recent VCS design and technology.

Expanded capabilities and requirements: Second, VCSs may now control more cargoes than they could in 1990, and are subject to additional Federal and State regulatory requirements. In 1990, Federal and State requirements limited VCSs to the control of vapor emissions from crude oil, gasoline blend, or benzene cargoes. The EPA and States now permit or require the control of vapor emissions from many other cargoes. *See* current EPA regulations in 40 CFR subpart Y, 40 CFR 63.560–63.568. In addition, EPA regulations now require marine tank vessels operating at major terminals that control VOC vapors to be vapor-tight and equipped with vapor collection systems. 40 CFR 63.562. Because current Coast Guard regulations have not been significantly amended since 1990, they do not reflect the expanded range of cargoes controlled by VCSs, nor do they reflect EPA's current 40 CFR 63.562 requirements.

Facilities and vessels that control vapors from cargoes other than crude oil, gasoline blend, or benzene, or that are subject to 40 CFR 63.562, may voluntarily comply with guidance that we provided in a policy letter sent to

VCS-certifying entities on May 5, 1992, or in Navigation and Vessel Inspection Circular (NVIC) No. 1–96 (April 1996), which provides safety standards for the design and operation of marine VCSs at tank barge cleaning facilities. This guidance was developed in close consultation with the Chemical Transportation Advisory Committee (CTAC), a Coast Guard advisory committee that operates under the Federal Advisory Committee Act, 5 U.S.C. Appendix 2, but it is not legally binding on these facilities and vessels. These guidance documents are available in the public docket. We wish to update our VCS regulations to incorporate this guidance in our regulatory requirements.

Our proposed changes would bring our regulations into line with the guidance we have developed to deal with post-1990 improvements in VCS design and technology, with the expanded capabilities that VCSs now provide, and with the expansion of the Federal and State regulatory environments in which VCSs function. The proposed changes would also adopt or modify many CTAC recommendations, all of which appear in the docket for this rulemaking.

IV. Discussion of Proposed Rule

The proposed new regulations:

- Reflect the expanded number and scope of Federal and State regulations for VCSs since 1990;
- Reflect advances in VCS technology and operational practices since 1990, particularly in vapor-balancing operations, cargo line clearing operations, and multi-breasted tandem barge-loading operations;
- Incorporate the policy guidance (1992 policy letter and 1996 NVIC; both available in the docket) and reflect regulatory exemptions and equivalency determinations that we have provided or granted since 1990;
- Provide new regulations for cargoes and operations, such as tank barge cleaning, that have become subject to Federal or State regulatory expansion since 1990;
- Provide for periodic operational reviews to ensure that VCSs are properly maintained and operated after they are certified;
- Provide an alternate test program for analyzers and pressure sensors, in addition to existing 24-hour pre-transfer/cleaning instrument testing requirements, to provide greater regulatory flexibility;
- Require certifying entities to be operated by currently licensed professional engineers, to ensure that certification is conducted by properly qualified professionals, and clarify the role of the certifying entity in VCS design, installation, and hazard reviews;
- Remove 33 CFR part 154, appendix B, which provides specifications for flame arresters, and requires flame arresters to meet third-party standards, because of apparent lack of public demand for these devices;
- Attempt to achieve greater clarity through the use of tabular presentation;
- Update industry standards that are incorporated by reference into our regulatory requirements;
- Phase in requirements for existing VCSs in order to moderate the economic impact of new requirements for those VCSs;
- Make conforming changes in regulations other than 33 CFR part 154, subpart E and 46 CFR part 39; and
- Make nonsubstantive changes in the wording or style of existing regulations, either to improve their clarity or to align them with current Federal regulatory style guidance.

Table 1 shows the sections affected by our proposed rule and, with reference to the foregoing discussion, briefly indicates how and why we propose to change, add, or remove regulatory text. The proposed regulatory text itself is, in many places, complex and technical. Therefore, we invite you to use Table 1 as a guide, but we urge you to read and analyze the proposed regulatory text following this preamble with care, to determine exactly how these proposed changes could affect you. We are providing an extended public comment period—6 months instead of the Coast Guard's normal 3-month period—to facilitate your in-depth review.

TABLE 1—PROPOSED CHANGES IN MARINE VCS REGULATIONS

Section	Proposed change and justification	
33 CFR:		
154.106	Update or add standards that are incorporated by reference, to reflect changes proposed elsewhere in Part 154 and, generally, to reflect technology improvements since 1990. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.	
154.310(b)	Amend operations manual requirements relating to VCSs to reflect other proposed changes and to ensure the operations manual provides adequate information.	
154.500	Update or add industry flange and coupling standards that are incorporated by reference, and make nonsubstantive wording or style changes.	
154.735	Update or add incorporated-by-reference industry standards for electrical wiring, electrical equipment, and tank cleaning or gas freeing operations involving oil residue or mixtures, and make nonsubstantive wording or style changes.	
154.740	Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.	
154.800–154.850 (33 CFR Part 154, Subpart E).	Remove these sections and transfer substance to new Subpart P, beginning with 33 CFR 154.2000, to facilitate the substantive changes we propose while preserving related material in a sequential arrangement. Existing sections and their proposed new locations are listed here:	
	Existing §	Proposed §
	154.800	154.2000
	154.802	154.2001
	154.804	154.2020–154.2023
	154.806	154.2010, 154.2011

TABLE 1—PROPOSED CHANGES IN MARINE VCS REGULATIONS—Continued

Section	Proposed change and justification
	154.808 ..... 154.2100 154.810 ..... 154.2101 154.812 ..... 154.2102 154.814 ..... 154.2103 154.820, 154.822 ..... 154.2105, 154.2106 154.824 ..... 154.2107 154.826 ..... 154.2108 154.828 ..... 154.2109 154.840 ..... 154.2030 154.850 ..... 154.2150
154.2000 (present 154.800)	Extend the applicability of this part to cover the range of cargoes that can be controlled by a VCS, and the range of facilities and operations using VCSs. Both have expanded since 1990. Grandfather existing facilities and provide for 3-year phase-in to moderate the economic impact of new requirements. Add language explaining the difference between regulatory measurements and parenthetical measurements that are included only for convenience, to eliminate possible confusion as to which measurement is the focus of the regulation. Clarify, without substantive change, that Coast Guard regulations do not require any vessel or facility to control vapor, but that the regulations apply to vessels or facilities that choose to or that, due to other laws, must control vapor. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
154.2001 (present 154.802)	Add definitions to reflect substantive changes proposed elsewhere in the NPRM. Make nonsubstantive wording or style changes.
154.2010, 154.2011 (present 154.806)	Reorganize provisions discussing qualifications and acceptance of certifying entities, for improved clarity. Codify current USCG guidance for those applying for acceptance as certifying entities, to eliminate possible confusion. Require certifying entities to use licensed professional engineers for VCS certification, to ensure that certification is conducted by persons with appropriate professional qualifications, as recommended by CTAC. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
154.2020–154.2023 (present 154.804)	Reorganize provisions discussing VCS certification and recertification for improved clarity, and add new requirements for operational reviews, to help reduce post-certification maintenance and operational problems. Clarify, without substantive change, that recertification is needed before an approved VCS can operate beyond the terms of its existing certification. Codify current USCG guidance for certifying entities conducting certification or recertification reviews, to standardize certification or recertification requirements and processes. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
154.2030 (present 154.840)	Add new training requirements to reflect other proposed changes. Add new training requirements for persons overseeing VCS maintenance, to help ensure a good-quality maintenance program between recertifications. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
154.2031	Add new section to address training requirements for tank barge cleaning facility personnel, because Federal and State regulations have expanded to include these facilities since 1990.
154.2100 (present 154.808)	Revise temperature limits to reflect additional cargoes. Modify or clarify (without substantive change) VCS piping, working pressure, remote indicator, alarm and shutdown activation, condensate control, VCS components/vapor suitability, and vapor processing unit provisions in line with current USCG guidance; thereby eliminating the current need, explained in Part III of this preamble, for equivalency or exemption determinations based on that guidance. Make nonsubstantive wording or style changes, and update or add standards that are incorporated by reference.
154.2101 (present 154.810)	Remove requirement for manual isolation valve between facility vapor connection and remotely operated cargo vapor shutoff valve to eliminate potential for overpressure if isolation valve is accidentally left closed, to reflect post-1990 equipment and operational practice improvements. Modify or clarify (without substantive change) remotely operated cargo vapor shutoff valve, vapor line marking, vapor hose, and electrical insulation provisions in line with current USCG guidance; thereby eliminating the current need, explained in Part III of this preamble, for equivalency or exemption determinations based on that guidance.

TABLE 1—PROPOSED CHANGES IN MARINE VCS REGULATIONS—Continued

Section	Proposed change and justification
	Make nonsubstantive wording or style changes, update or add standards that are incorporated by reference, and conform cross references to reflect proposed redesignations.
154.2102 (present 154.812)	Exclude facilities that collect vapors emitted during inerting of vessel cargo tanks because during cargo tank inerting, an inert gas instead of a liquid is added into the cargo tank and therefore there is no liquid overfill hazard, in line with current USCG guidance; thereby eliminating the current need, explained in Part III of this preamble, for equivalency or exemption determinations based on that guidance. Eliminate requirement for separate overfill control panels, to reflect post-1990 equipment and operational practice improvements; the change would allow the overfill control system to be incorporated into other control panels to save cost. Clarify, without substantive change, what type of facilities need to have explosion-proof overfill receptacles. Align labeling requirements with current equipment vendor practice, which is suitable for these requirements. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
154.2103 (present 154.814)	Revise to reflect additional cargoes that have been added since 1990. Require low-pressure sensors only if vapor-moving device is used to draw vapor; the change would allow cost savings because a vapor-moving device is the source of vacuum in a VCS. Require pressure sensors in facilities that collect vapors while inerting vessel cargo tanks, to prevent overpressurization hazard caused by inert gas added into the cargo tanks. Modify or clarify (without substantive change) cargo vapor shutoff valve closing, shutdown setpoint, pressure sensor location, and pressure relief valve provisions in line with current USCG guidance; thereby eliminating the current need, explained in Part III of this preamble, for equivalency or exemption determinations based on that guidance. Limit requirements for flame arresters or flame screens to the flammable, combustible, or non-high flash point liquid cargoes for which flame is a serious threat. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
154.2104	Add new section to provide for cargo line clearance systems, to reflect post-1990 equipment and operational practice improvements, in line with current USCG guidance; thereby eliminating the current need, explained in Part III of this preamble, for equivalency or exemption determinations based on that guidance.
154.2105, 154.2106 (present 154.820, 154.822).	Reorganize provisions for improved clarity.
	Revise to reflect additional cargoes that have been added since 1990. Limit applicability to the flammable, combustible, or non-high flash point liquid cargoes for which fire, explosion, or detonation are serious threats. Remove flame arrester provisions (and Appendix B) due to apparent lack of public demand for these devices. To maintain the equivalent level of safety, flame arresters are required to meet industry standards and the VCS is required to have additional safety monitoring instruments which will activate emergency VCS shutdown. Modify or clarify VCS controlling inerted cargo vapors, oxygen analyzer, dock detonation arrester location, discharge vent, and detonation arrester installation provisions in line with current USCG guidance; thereby eliminating the current need, explained in Part III of this preamble, for equivalency or exemption determinations based on that guidance. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
154.2107 (present 154.824)	Revise to reflect additional cargoes (added since 1990) that share the flammable, combustible, or non-high flash point characteristics of cargoes covered by the existing regulation. Modify, add, or clarify (without substantive change) vapor line purging, gas injection location, analyzer controlling scheme, analyzer response time, analyzer alarm and shutdown setpoint, inert gas producing combustion device separation, and base loading method provisions in line with current USCG guidance; thereby eliminating the current need, explained in Part III of this preamble, for equivalency or exemption determinations based on that guidance. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
154.2108 (present 154.826)	Revise to reflect additional cargoes added since 1990; limit paragraphs (b) and (e) to flammable, combustible, or non-high flash point cargoes that are subject to fire, detonation, or explosion. Remove references to flame arresters, explosion suppressors, and other systems for which there is an apparent lack of public demand or which USCG generally has not accepted. Allow only Coast Guard-accepted detonation arresters, to improve safety.

TABLE 1—PROPOSED CHANGES IN MARINE VCS REGULATIONS—Continued

Section	Proposed change and justification
	Modify or clarify (without substantive change) detonation arrester, alarm, and construction provisions in line with current USCG guidance; thereby eliminating the current need, explained in Part III of this preamble, for equivalency or exemption determinations based on that guidance. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
154.2109 (present 154.828)	Revise to reflect additional cargoes added since 1990; limit paragraphs (a), (b), and (e) to flammable, combustible, or non-high flash point cargoes that are subject to fire, detonation, or explosion. Remove references to flame arresters, explosion suppressors, and other systems USCG generally has not accepted. Allow only Coast Guard-accepted detonation arresters, to improve safety. Modify, add, or clarify (without substantive change) quick-closing stop valve, anti-flashback burner, liquid seal, and vapor-moving device shutdown provisions in line with current USCG guidance; thereby eliminating the current need, explained in Part III of this preamble, for equivalency or exemption determinations based on that guidance. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
154.2110	Add new section to provide for facilities that control vapors to or from vessel cargo tanks through vapor balancing, to reflect post-1990 equipment and operational practice improvements. Limit the applicability of paragraphs (a)(2), (a)(4), (b), and (c) to flammable, combustible, or non-high flash point cargoes that are subject to fire, detonation, or explosion, as those paragraphs require measures that are only intended to address the risks posed by such cargoes.
154.2111	Add new section to provide for connection of a marine VCS to a facility's main VCS, to reflect technology advances since 1990.
154.2112	Add new section to provide for additional cargoes that have potential to polymerize or freeze, which have become subject to Federal or State regulatory coverage since 1990.
154.2113	Add new section to provide for additional cargoes that are alkylene oxides, which have become subject to Federal or State regulatory coverage since 1990.
154.2150 (present 154.850)	Revise to reflect substantive changes proposed elsewhere in the NPRM. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
154.2180, 154.2181	Provide additional regulatory flexibility by adding new sections to provide testing program for analyzers and pressure sensors as an alternative to compliance with 154.2150 and 154.2250.
154.2200–154.2250	Add new sections to provide for tank barge cleaning facilities, which have become subject to Federal or State regulatory coverage since 1990, in line with NVIC No. 1–96 as modified by CTAC recommendations.
154, Appendix B	Remove appendix dealing with tank vent flame arresters due to apparent lack of public demand for these devices; *see* entry above for 154.2105, 154.2106.
155.750	Update cross references.
156.120	Revise to reflect substantive changes proposed elsewhere in the NPRM.
156.170	Update cross references. Allow alternative methods of compliance with testing and inspection requirements, in line with public comment received on periodic renewal of OMB approval for collection of information; *see* Docket USCG–2005–22983 in Regulations.gov.
46 CFR: 35.35–5	Prohibit use of ship-to-shore bonding cables, to align with International Maritime Organization and International Safety Guide for Oil Tankers and Terminals policy, and make nonsubstantive wording or style changes.
35.35–20, 35.35–30	Revise to reflect substantive changes proposed elsewhere in the NPRM.
Part 39	Revise and transfer substance from existing sections to proposed new locations as listed here, to facilitate the substantive changes we propose while preserving related material in a sequential arrangement.

TABLE 1—PROPOSED CHANGES IN MARINE VCS REGULATIONS—Continued

Section	Proposed change and justification	
	Existing §	Proposed §
	39.10–1	39.1001
	39.10–3	39.1003
	39.10–5	39.1005
	39.10–9	39.1009
	39.10–11	39.1011
	39.10–13	39.1013, 39.1015
	39.20–1	39.2001
	39.20–3	39.2003
	39.20–7	39.2007
	39.20–9	39.2009
	39.20–11	39.2011
	39.20–13	39.2013
	39.30–1	39.3001
	39.40–1	39.4001
	39.40–3	39.4003
	39.40–5	39.4005
39.1001 (present 39.10–1)	Revise applicability to reflect additional cargoes and VCS operations that have become subject to Federal or State regulatory coverage since 1990. Grandfather existing tank barges and provide for 5-year phase-in to moderate the economic impact of new requirements, and codify current USCG guidance. Add language explaining the difference between regulatory measurements and parenthetical measurements that are included only for convenience, to eliminate possible confusion as to which measurement is the focus of the regulation. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.	
39.1003 (present 39.10–3)	Add definitions to reflect substantive changes proposed elsewhere in the NPRM. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.	
39.1005 (present 39.10–5)	Update, without substantive change, the general incorporation-by-reference section in line with current Office of the federal register requirements for the language of such sections. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.	
39.1009 (present 39.10–9)	Clarify, without substantive change, that vapor processing units can be either permanent or portable. Clarify, without substantive change, that vapor processing unit piping and components need to meet 46 CFR chapter I, subchapter F and electrical equipment need to meet 46 CFR chapter I, subchapter J. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.	
39.1011 (present 39.10–11)	Add new pre-cleaning procedures, which have become subject to Federal or State regulatory coverage since 1990, to personnel training requirements.	
39.1013, 39.1015 (present 39.10–13)	Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations. Clarify, without substantive change, by placing alternative for foreign-flagged vessels in a separate section (39.1015). For the regulated public's benefit, provide additional information about the process for Marine Safety Center review and approval of proposed modification of existing USCG-approved vapor collection system. Clarify, without substantive change, that vapor processing unit is reviewed with tank vessel as a system. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.	
39.1017	Add new section for tank barge multi-breasted loading, to reflect post-1990 operational practice improvements, and cargo tank gas-freeing or cleaning operations, which have become subject to Federal or State regulatory coverage since 1990.	
39.2001 (present 39.20–1)	Allow flexible hoses and quick disconnect couplings, to reflect technology advances since 1990. Require overfill alarm and shutdown systems as primary overfill protection for toxic cargoes, to reflect technology advances since 1990. Make nonsubstantive wording or style changes, conform cross references to reflect proposed redesignations, and update or add standards that are incorporated by reference.	

TABLE 1—PROPOSED CHANGES IN MARINE VCS REGULATIONS—Continued

Section	Proposed change and justification
39.2003 (present 39.20–3)	Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
39.2007 (present 39.20–7)	Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
39.2009 (present 39.20–9)	Clarify, without substantive change, tank overfill sensor switch requirements. Add provisions for tank barges with toxic cargoes that have become subject to Federal or State regulatory coverage since 1990. Make nonsubstantive wording or style changes, conform cross references to reflect proposed redesignations, and update or add standards that are incorporated by reference.
39.2011 (present 39.20–11)	Revise cargo tank venting system capacity requirement to reflect additional cargoes that have become subject to Federal or State regulatory coverage since 1990, in line with current USCG guidance. Clarify, without substantive change, the range of vacuum pressure at which cargo tank venting system cannot relieve. Allow liquid-filled pressure-vacuum breakers, to reflect new technology since 1990. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
39.2013 (present 39.20–13)	Clarify, without substantive change, the location requirement for pressure sensors. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
39.2014	Add new section for polymerizing cargoes that have become subject to Federal or State regulatory coverage since 1990.
39.2015	Add new section for tank barge pressure sensors, to improve safety and to reflect new technology since 1990.
39.3001 (present 39.30–1)	Replace obsolete “letter of adequacy” requirement with certification and operations manual endorsement requirements. Clarify, without substantive change, the venting capacities of pressure-vacuum relief valves used in determining cargo loading rates. Clarify, without substantive change, the metallic sampling equipment bonded requirement for static accumulating cargoes. Revise oxygen concentration requirements to reflect additional cargoes that have become subject to Federal or State regulatory coverage since 1990. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations. Update or add, generally to reflect technology advances since 1990, industry standards that are incorporated by reference.
39.4001 (present 39.40–1)	Revise to reflect additional operations and cargoes that have become subject to Federal or State regulatory coverage since 1990. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
39.4003 (present 39.40–3)	Revise to reflect additional operations and cargoes that have become subject to Federal or State regulatory coverage since 1990. Clarify, without substantive change, that the detonation arrester requirement applies only to non-inerted flammable or combustible cargoes that are subject to serious flame or combustion risks. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
39.4005 (present 39.40–5)	Revise to reflect additional operations and cargoes that have become subject to Federal or State regulatory coverage since 1990. Make nonsubstantive wording or style changes and conform cross references to reflect proposed redesignations.
39.5001–39.5005	Add new sections on tank barge multi-breasted loading, to reflect post-1990 operational practice improvements in line with current USCG policy; thereby eliminating the current need, explained in Part III of this preamble, for equivalency or exemption determinations based on design information and calculations.
39.6001–39.6009	Add new sections on tank barge cleaning operations, which have become subject to Federal or State regulatory coverage since 1990, in line with existing USCG guidance provided by NVIC No. 1–96, as modified by CTAC recommendations.

V. Incorporation by Reference

Material proposed for incorporation by reference appears in 33 CFR 154.106 and 46 CFR 39.1005. You may inspect this material at U.S. Coast Guard Headquarters where indicated under **ADDRESSES**. Copies of the material are available from the sources listed in 33 CFR 154.106 and 46 CFR 39.1005.

Before publishing a binding rule, we will submit this material to the Director of the Federal Register for approval of the incorporation by reference.

VI. Regulatory Analyses

We developed this proposed rule after considering numerous statutes and executive orders related to rulemaking. Below we summarize our analyses based on 13 of these statutes or executive orders.

A. Regulatory Planning and Review

This proposed rule is not a significant regulatory action under section 3(f) of Executive Order 12866, Regulatory Planning and Review, and does not require an assessment of potential costs and benefits under section 6(a)(3) of that Order. OMB has not reviewed it under that Order.

A combined preliminary Regulatory Analysis and an Initial Regulatory Flexibility Analysis is available in the docket where indicated under the "Public Participation and Request for Comments" section of this preamble. A summary of the analysis follows:

The proposed rule would revise the existing regulations (33 CFR Parts 154 and 156, 46 CFR Parts 35 and 39) regarding the safety of facility and vessel VCSs. This rulemaking would amend the regulations to make VCS requirements more compatible with other Federal and State environmental requirements, regulate industry advancements in VCS technology, and codify the standards for VCSs at tank barge cleaning facilities. The proposed rule would increase the safety of operations by regulating the design, installation, and use of VCSs, but would not require anyone to install or use VCSs.

The proposed rule would provide additional requirements for VCS equipment, compliance documentation, training, and operations. In general, this rulemaking would:

- Add new requirements for certifications, recertifications, periodic operational reviews, and approval processes for certain operations concerning VCSs to improve safety. These various requirements mainly affect facilities with VCSs, including tank barge cleaning facilities.
- Require new training or amend training requirements to improve safety. These proposed training requirements affect facilities with VCSs (including tank barge cleaning facilities) and tank barge owners and operators.
- Permit cargo line clearing; however, there would be some requirements to receive Coast Guard permission to do so.
- Provide foreign-flagged tank barges some flexibility for certification procedures.
- Add new requirements for certain equipment on U.S.-flagged tank barges and at tank barge cleaning facilities and other facilities with VCSs to improve safety and environmental protection.
- Removes certain requirements in order to offer cost savings. This change mainly impacts facilities with VCSs.

The proposed rule is necessary to reflect the expansion of Federal and State regulations for VCSs since the current regulations were adopted in 1990, and to reflect technological advances over that period. Without revisions to the regulation by the Coast Guard, market failures would persist in creating situations of uncompensated risk. In the case of this proposed rule, the uncompensated risks accrue to the public, maritime commerce, and mariners in the form of safety hazards.

Affected Population

Based on Coast Guard data, we estimate this proposed rule would affect 234 facilities with VCSs, 25 certifying entities, 15 tank barge cleaning facilities, 216 U.S.-flagged tank barge owners, and owners of 338 foreign-flagged tank barges.

Costs

Over a 10-year period of analysis, we estimate the total present value cost of the rulemaking to be approximately $8.8 million at a 7 percent discount rate and approximately $10.3 million at a 3 percent discount rate. Over the same 10-year period of analysis, we estimate the annualized cost of this proposed rule to be $1.3 million at 7 percent and $1.2 million at 3 percent.

Benefits

The proposed rule would amend existing regulations regarding VCSs in marine activities. The Coast Guard is pursuing this amendment to existing standards to reflect technological improvements and to expand environmental protection. The proposed rule would promote maritime safety and environmental stewardship. It offers provisions for more practicable and efficient management of hazardous materials. The proposed rule contains some provisions which would offer facilities the opportunity to reduce maintenance costs.

See the preliminary Regulatory Analysis available in the docket for a detailed analysis of the costs and benefits of this rulemaking.

B. Small Entities

Under the Regulatory Flexibility Act (5 U.S.C. 601–612), we have considered the impact of this rule on small entities. The term "small entities" comprises small businesses, not-for-profit organizations that are independently owned and operated and are not dominant in their fields, and governmental jurisdictions with populations of fewer than 50,000.

A combined preliminary Regulatory Analysis and Initial Regulatory Flexibility Analysis discussing the impact of this proposed rule on small entities is available in the docket where indicated under the "Public Participation and Request for Comments" section of this preamble.

Based on our analysis, we estimate that small entities affected by this rulemaking are primarily small businesses consisting of certifying entities, owners and operators of tank barge cleaning facilities, tank barges, and facilities with VCSs. We did not find data to suggest small not-for-profit organizations or small government entities would be directly affected by this rulemaking. In addition, certifying entities would incur no additional costs due to the proposed rule and are not analyzed further. We evaluated the impact on small entities for each segment of industry that incur additional costs, since this rulemaking would require different provisions for owners and operators of tank barge cleaning facilities, tank barges, and facilities with VCSs.

Based on our assessment, 54 percent of tank barge owners affected by this rulemaking would be considered small by Small Business Administration (SBA) size standards. We estimate 97 percent of these small entities would incur cost impacts that are 1 percent or less than their annual revenues during the highest cost year (implementation year). The remainder would incur annual cost impacts between 1 and 3 percent of their annual revenues.

We estimate 8 percent of facilities with VCSs would be small by SBA size standards. We estimate that almost 93 percent of these small entities would incur annual cost impacts that are 1 percent or less than their annual revenues during the highest cost year (implementation year) as well as

annually. Another 7 percent would have cost impacts between 1 to 3 percent of their revenue.

We estimate all of the tank barge cleaning facilities are considered small by SBA size standards. We estimate 64 percent of these tank barge cleaning facilities would incur cost impacts that are potentially greater than 3 percent of their annual revenues during the highest cost year (implementation year). However, the proposed rule would codify existing voluntary standards for tank barge cleaning facilities. We anticipate the cost impacts to tank barge cleaning facilities may be overestimates.

We are interested in the potential impacts from this proposed rule on small businesses and we request public comment on these potential impacts. If you think that your business, organization, or governmental jurisdiction qualifies as a small entity and that this rulemaking would have a significant economic impact on it, please submit a comment to the Docket Management Facility at the address under **ADDRESSES**. In your comment, explain why, how, and to what degree you think this rule would have an economic impact on you.

C. Assistance for Small Entities

Under section 213(a) of the Small Business Regulatory Enforcement Fairness Act of 1996 (Pub. L. 104–121), we want to assist small entities in understanding this proposed rule so that they can better evaluate its effects on them and participate in the rulemaking. If the proposed rule would affect your small business, organization, or governmental jurisdiction and you have questions concerning its provisions or options for compliance, please consult Ms. Sara Ju at the address listed under **ADDRESSES**. The Coast Guard will not retaliate against small entities that question or complain about this rule or any policy or action of the Coast Guard.

Small businesses may send comments on the actions of Federal employees who enforce, or otherwise determine compliance with, Federal regulations to the Small Business and Agriculture Regulatory Enforcement Ombudsman and the Regional Small Business Regulatory Fairness Boards. The Ombudsman evaluates these actions annually and rates each agency's responsiveness to small business. If you wish to comment on actions by employees of the Coast Guard, call 1–888–REG–FAIR (1–888–734–3247).

D. Collection of Information

This proposed rule would require an amendment to an existing collection of information (1625–0060) as defined by the Paperwork Reduction Act of 1995 (44 U.S.C. 3501–3520). As defined in 5 CFR 1320.3(c), "collection of information" comprises reporting, recordkeeping, monitoring, posting, labeling, and other similar actions. The title and description of the information collections, a description of those who must collect the information, and an estimate of the total annual burden follow. The estimate covers the time for reviewing instructions, searching existing sources of data, gathering and maintaining the data needed, and completing and reviewing the collection.

Title: Vapor Control Systems for Facilities and Tank Vessels.

OMB Control Number: 1625–0060.

Summary of the Collection of Information: This collection of information ensures industry compliance with safety standards for VCSs. The proposed rule would require recordkeeping and reporting on the design and use of VCSs. The proposed rule contains collection of information requirements which include: Certifications, recertifications, approval requests, review of operating manuals, failure analyses, operational review letters, and relabeling. The collection of information would aid the Coast Guard and industry in assuring safe practices associated with VCSs.

Need for Information: The Coast Guard needs this information to ensure industry use of VCS requirements are compatible with new Federal and State environmental requirements, to regulate industry advancements in VCS technology, and to ensure the safe design and operation of a VCS at a tank barge cleaning facility.

Proposed Use of Information: The Coast Guard would use this information to determine whether an entity meets the statutory requirements.

Description of the Respondents: The respondents are owners/operators of tank barge cleaning facilities, facilities and tank vessels. Reporting and recordkeeping requirements will be completed by facility and vessel owners/operators, persons in charge, engineers, maintenance workers, and operations managers of affected tank barges, tank barge cleaning facilities, facilities, and certifying entities.

Number of Respondents: The burden change of this collection of information includes certifications, re-certifications, approval requests, reviewing operating manuals, preparing operational review letters, and relabeling. This collection of information applies to various owners and operators of tank barges, facilities, tank barge cleaning facilities, and certifying entities. We estimate the total number of respondents is 490.

Frequency of Responses: This proposed rule will vary the number of responses each year by requirement. Some actions are one time only and others are required more frequently.

Burden of Response: This collection of information applies to certifying entities, tank barge owners/operators and owners/operators of facilities with VCS. The Coast Guard estimates the total number of respondents is 490. The burden of response varies by collection of information requirement.

Estimate of Total Annual Burden: The total annual burden is estimated to increase by 7,197 hours (as a result of the proposed rule.

As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), we will submit a copy of this proposed rule to OMB for its review of the collection of information.

We ask for public comment on the proposed collection of information to help us determine how useful the information is; whether it can help us perform our functions better; whether it is readily available elsewhere; how accurate our estimate of the burden of collection is; how valid our methods for determining burden are; how we can improve the quality, usefulness, and clarity of the information; and, how we can minimize the burden of collection.

If you submit comments on the collection of information, submit them both to OMB and to the Docket Management Facility where indicated under **ADDRESSES**, by the date under **DATES**.

You need not respond to a collection of information unless it displays a currently valid control number from OMB. Before the Coast Guard could enforce the collection of information requirements in this proposed rule, OMB would need to approve the

E. Federalism

A rule has implications for federalism under Executive Order 13132, Federalism, if it has a substantial direct effect on State or local governments and would either preempt State law or impose a substantial direct cost of compliance on them. We have analyzed this proposed rule under that Order and have determined that it does not have implications for federalism.

F. Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1531–1538) requires Federal agencies to assess the effects of their discretionary regulatory actions. In particular, the Act addresses actions that may result in the expenditure by a

State, local, or Tribal government, in the aggregate, or by the private sector of $100,000,000 (adjusted for inflation) or more in any one year. Though this proposed rule would not result in such an expenditure, we do discuss the effects of this rule elsewhere in this preamble.

G. Taking of Private Property

This proposed rule would not cause a taking of private property or otherwise have taking implications under Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights.

H. Civil Justice Reform

This proposed rule meets applicable standards in sections 3(a) and 3(b)(2) of Executive Order 12988, Civil Justice Reform, to minimize litigation, eliminate ambiguity, and reduce burden.

I. Protection of Children

We have analyzed this proposed rule under Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. This rule is not an economically significant rule and would not create an environmental risk to health or risk to safety that might disproportionately affect children.

J. Indian Tribal Governments

This proposed rule does not have Tribal implications under Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, because it would not have a substantial direct effect on one or more Indian Tribes, on the relationship between the Federal Government and Indian Tribes, or on the distribution of power and responsibilities between the Federal Government and Indian Tribes.

K. Energy Effects

We have analyzed this proposed rule under Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use. We have determined that it is not a "significant energy action" under that order because it is not a "significant regulatory action" under Executive Order 12866 and is not likely to have a significant adverse effect on the supply, distribution, or use of energy. The Administrator of the Office of Information and Regulatory Affairs has not designated it as a significant energy action. Therefore, it does not require a Statement of Energy Effects under Executive Order 13211.

L. Technical Standards

The National Technology Transfer and Advancement Act (NTTAA) (15 U.S.C. 272 note) directs agencies to use voluntary consensus standards in their regulatory activities unless the agency provides Congress, through the Office of Management and Budget, with an explanation why using these standards would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (*e.g.,* specifications of materials, performance, design, or operation; test methods; sampling procedures; and related management systems practices) that are developed or adopted by voluntary consensus standards bodies.

This proposed rule uses voluntary consensus standards from the following organizations: American Petroleum Institute (API), American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), International Electrotechnical Commission (IEC), International Maritime Organization (IMO), National Electrical Manufacturers Association (NEMA), National Fire Protection Association (NFPA), Oil Companies International Marine Forum (OCIMF), and Underwriters Laboratories, Inc. (UL). The proposed sections that reference these standards and the locations of these standards are listed in 33 CFR 154.106 and 46 CFR 39.1005.

If you disagree with our analysis of the voluntary consensus standards listed above or are aware of voluntary consensus standards that might apply but are not listed, please send a comment to the docket using one of the methods under **ADDRESSES.** In your comment, please explain why you disagree with our analysis and/or identify voluntary consensus standards we have not listed that might apply.

M. Environment

We have analyzed this proposed rule under Department of Homeland Security Management Directive 023–01 and Commandant Instruction M16475.lD, which guide the Coast Guard in complying with the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321–4370f), and have made a preliminary determination that this action is one of a category of actions which do not individually or cumulatively have a significant effect on the human environment. A preliminary environmental analysis checklist supporting this determination is available in the docket where indicated under the "Public Participation and Request for Comments" section of this preamble. This rule involves regulations concerning vessel operation safety standards and regulations concerning manning, documentation, admeasurement, inspection, and equipping of vessels. We seek any comments or information that may lead to the discovery of a significant environmental impact from this proposed rule.

List of Subjects

33 CFR Part 154

Alaska, Fire prevention, Hazardous substances, Incorporation by reference, Oil pollution, Reporting and recordkeeping requirements.

33 CFR Part 155

Alaska, Hazardous substances, Oil pollution, Reporting and recordkeeping requirements.

33 CFR Part 156

Hazardous substances, Oil pollution, Reporting and recordkeeping requirements, Water pollution control.

46 CFR Part 35

Cargo vessels, Marine safety, Navigation (water), Occupational safety and health, Reporting and recordkeeping requirements, Seamen.

46 CFR Part 39

Cargo vessels, Fire prevention, Hazardous materials transportation, Incorporation by reference, Marine safety, Occupational safety and health, Reporting and recordkeeping requirements.

For the reasons discussed in the preamble, the Coast Guard proposes to amend 33 CFR chapter I, and 46 CFR chapter I as follows:

33 CFR—Navigation and Navigable Waters

PART 154—FACILITIES TRANSFERRING OIL OR HAZARDOUS MATERIAL IN BULK

1. The authority citation for part 154 is revised to read as follows:

Authority: 33 U.S.C. 1225, 1231, 1321(j)(1)(C), (j)(5), (j)(6), and (m)(2); sec. 2, E.O. 12777, 56 FR 54757; Department of Homeland Security Delegation No. 0170.1. Subpart F is also issued under 33 U.S.C. 2735. Vapor control recovery provisions of Subpart P are also issued under 42 U.S.C. 7511b(f)(2).

2. Revise § 154.106 to read as follows:

§ 154.106 Incorporation by reference.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1

CFR part 51. To enforce any edition other than that specified in this section, the Coast Guard must publish a notice of change in the **Federal Register** and the material must be available to the public. All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030 or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.* Also, it is available for inspection at the Coast Guard, Office of Operating and Environmental Standards (CG–522), 2100 2nd Street, SW., Stop 7126, Washington, DC 20593–7126, and is available from the sources indicated in this section.

(b) American Petroleum Institute (API), 1220 L Street, NW., Washington, DC 20005.

(1) API Standard 2000, Venting Atmospheric and Low-Pressure Storage Tanks (Non-refrigerated and Refrigerated), Third Edition, January 1982 (reaffirmed December 1987) ("API 2000"), incorporation by reference (IBR) approved for 33 CFR 154.2103 and 154.2203.

(2) API Recommended Practice 550, Manual on Installation of Refinery Instruments and Control Systems, Part II—Process Stream Analyzers, Section 1—Oxygen Analyzers, Fourth Edition, February 1985 ("API 550"), IBR approved for 33 CFR 154.2107.

(c) American National Standards Institute (ANSI), 25 West 43rd Street, 4th floor, New York, NY 10036.

(1) ANSI B16.5, Steel Pipe Flanges and Flanged Fittings, 1988, IBR approved for 33 CFR 154.500, 154.2100, 154.2101, 154.2202, and 33 CFR part 154, Appendix A.

(2) ANSI B16.24, Bronze Pipe Flanges and Flange Fittings Class 150 and 300, 1979, IBR approved for 33 CFR 154.500 and 154.2100.

(3) ANSI B16.34, Valves—Flanged, Threaded, and Welding End, 2004, IBR approved for 33 CFR 154.2100.

(4) ANSI B31.3, Chemical Plant and Petroleum Refinery Piping, 1987 (including B31.3a–1988, B31.3b–1988, and B31.3c–1989 addenda), IBR approved for 33 CFR 154.510 and 154.2100.

(d) American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959.

(1) ASTM F 631–93, Standard Guide for Collecting Skimmer Performance Data in Controlled Environments ("ASTM F 631"), IBR approved for 33 CFR part 154, Appendix C.

(2) ASTM F 715–95, Standard Test Methods for Coated Fabrics Used for Oil Spill Control and Storage ("ASTM F 715"), IBR approved for 33 CFR part 154, Appendix C.

(3) ASTM F 722–82 (1993), Standard Specification for Welded Joints for Shipboard Piping Systems ("ASTM F 722"), IBR approved for 33 CFR part 154, Appendix A.

(4) ASTM F 1122–87 (1992), Standard Specification for Quick Disconnect Couplings ("ASTM F 1122"), IBR approved for 33 CFR 154.500.

(5) ASTM F 1155–98, Standard Practice for Selection and Application of Piping System Materials ("ASTM F 1155"), IBR approved for 33 CFR part 154, Appendix A.

(6) ASTM F 1273–91 (Reapproved 1996) Standard Specification for Tank Vent Flame Arresters ("ASTM F 1273"), IBR approved for 33 CFR 154.2001.

(e) International Electrotechnical Commission (IEC), Bureau Central de la Commission Electrotechnique Internationale, 3, rue de Varembé, P.O. Box 131, CH—1211 Geneva 20, Switzerland.

(1) IEC 60309–1 Plugs, Socket-Outlets and Couplers for Industrial Purposes—Part 1: General Requirements, Edition 4.1 2005–12, IBR approved for 33 CFR 154.2102.

(2) IEC 60309–2 Plugs, Socket-Outlets and Couplers for Industrial Purposes—Part 2: Dimensional Interchangeability Requirements for Pin and Contact-tube Accessories, Edition 4.1 2005–12, IBR approved for 33 CFR 154.2102.

(f) National Electrical Manufacturers Association (NEMA), 1300 North 17th Street, Suite 1752, Rosslyn, VA 22209.

(1) ANSI NEMA WD–6—Wiring Devices, Dimensional Requirements, 1988 ("NEMA WD–6"), IBR approved for 33 CFR 154.2102.

(2) [Reserved]

(g) National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169–7471.

(1) NFPA 51B, Standard for Fire Prevention in Use of Cutting and Welding Processes, 1994, IBR approved for 33 CFR 154.735.

(2) NFPA 70, National Electrical Code, 1987, IBR approved for 33 CFR 154.735.

(3) NFPA 70, National Electrical Code, 2002, IBR approved for 33 CFR 154.2100 and 154.2102.

(h) Oil Companies International Marine Forum (OCIMF), 29 Queen Anne's Gate, London, SW1H 9BU, England.

(1) International Safety Guide for Oil Tankers and Terminals, Fifth Ed., 2006 ("ISGOTT"), IBR approved for 33 CFR 154.735, 154.2101, and 154.2203.

(2) [Reserved]

(i) Underwriters Laboratories, Inc. (UL), 333 Pfingsten Road, Northbrook, IL 60062.

(1) UL 525 Standard for Flame Arresters, 8th Edition, May 9, 2008, IBR approved for 33 CFR 154.2001.

(2) [Reserved]

3. In § 154.310, revise paragraph (b) to read as follows:

§ 154.310 Operations manual: Contents.

* * * * *

(b)(1) The operations manual must contain a description of the facility's vapor control system (VCS), if the facility—

(i) Collects vapor emitted from vessel cargo tanks for recovery, destruction, or dispersion; or

(ii) Balances vapor to or from vessel cargo tanks.

(2) The VCS description required by paragraph (b)(1) of this section must include a line diagram or simplified piping and instrumentation diagram (P&ID) of the facility's VCS piping, including the location of each valve, control device, pressure-vacuum relief valve, pressure indicator, flame arrester, and detonation arrester;

(3) The VCS description required by paragraph (b)(1) of this section must describe the design and operation of its—

(i) Vapor line connection;

(ii) Startup and shutdown procedures;

(iii) Steady-state operating procedures;

(iv) Provisions for dealing with pyrophoric sulfide (for facilities which handle inerted vapors of cargoes containing sulfur);

(v) Alarms and shutdown devices; and

(vi) Pre-transfer equipment inspection requirements.

(4) The VCS description required by paragraph (b)(1) of this section must include all test procedures and a checklist for use during the testing of the VCS required by 33 CFR 156.170(g). The test procedures must specify—

(i) All tests required for initial certification under 33 CFR 154.2022(d);

(ii) All components that are to be tested; and

(iii) Procedures for testing each component.

(5) The VCS description required by paragraph (b)(1) of this section must include—

(i) A list of all cargoes the VCS is approved to control; and

(ii) Copies of any Coast Guard letters exempting the VCS from regulatory requirements.

(6) The VCS description required by paragraph (b)(1) of this section must include detailed operating instructions

for a cargo line clearance system as described in 33 CFR 154.2104, if such a system is used by a facility;

(7) The VCS description required by paragraph (b)(1) of this section must include the following for a tank barge cleaning facility:

(i) A physical description of the facility and facility plan showing mooring areas, locations where cleaning operations are conducted, control stations, and locations of safety equipment;

(ii) The sizes, types, and number of tank barges from which the facility can conduct cleaning operations simultaneously; and

(iii) The minimum number of persons required to be on duty during cleaning operations and the duties of each.

* * * * *

4. Revise § 154.500 to read as follows:

§ 154.500 Hose assemblies.

Each hose assembly used for transferring oil or hazardous material must meet the following requirements:

(a) The minimum design burst pressure for each hose assembly must be at least four times the sum of the pressure of the relief valve setting (or four times the maximum pump pressure when no relief valve is installed) plus the static head pressure of the transfer system, at the point where the hose is installed.

(b) The maximum allowable working pressure (MAWP) for each hose assembly must be more than the sum of the pressure of the relief valve setting (or the maximum pump pressure when no relief valve is installed) plus the static head pressure of the transfer system, at the point where the hose is installed.

(c) Each nonmetallic hose must be usable for oil or hazardous material service.

(d) Each hose assembly must either have—

(1) Full threaded connections;

(2) Flanges that meet ANSI B16.5 or ANSI B.16.24 (both incorporated by reference, *see* 33 CFR 154.106); or

(3) Quick-disconnect couplings that meet ASTM F 1122 (incorporated by reference, *see* 33 CFR 154.106).

(e) Each hose must be marked with one of the following:

(1) The name of each product for which the hose may be used; or

(2) For oil products, the words "OIL SERVICE"; or

(3) For hazardous materials, the words "HAZMAT SERVICE—SEE LIST" followed immediately by a letter, number or other symbol that corresponds to a list or chart contained in the facility's operations manual or the vessel's transfer procedure documents which identifies the products that may be transferred through a hose bearing that symbol.

(f) Each hose also must be marked with the following, except that the information required by paragraphs (f)(2) and (3) of this section need not be marked on the hose if it is recorded in the hose records of the vessel or facility, and the hose is marked to identify it with that information:

(1) Maximum allowable working pressure;

(2) Date of manufacture; and

(3) Date of the latest test required by 33 CFR 156.170.

(g) The hose burst pressure and the pressure used for the test required by 33 CFR 156.170 must not be marked on the hose and must be recorded elsewhere at the facility as described in paragraph (f) of this section.

(h) Each hose used to transfer fuel to a vessel that has a fill pipe for which containment cannot practically be provided must be equipped with an automatic back pressure shutoff nozzle.

5. In § 154.735—

a. In paragraph (q), remove the term "NFPA 70" and add, in its place, the words "NFPA 70 (incorporated by reference, *see* 33 CFR 154.106)"; and

b. Revise paragraph (s) to read as follows:

§ 154.735 Safety requirements.

* * * * *

(s) Tank-cleaning or gas-freeing operations conducted by the facility on vessels carrying oil residues or mixtures must be conducted in accordance with sections 11.3 and 11.4 of OCIMF ISGOTT (incorporated by reference, *see* 33 CFR 154.106), except that—

(1) Prohibitions in ISGOTT against the use of recirculated wash water do not apply if the wash water is first processed to remove product residues;

(2) The provisions in ISGOTT section 11.3.6.10 that removal of sludge, scale, and sediment do not apply if personnel use breathing apparatuses which protect them from the tank atmosphere; and

(3) Upon the request of the facility owner or operator in accordance with 33 CFR 154.107, the COTP may approve the use of alternate standards to ISGOTT if the COTP determines that the alternative standards provide an equal level of protection to the ISGOTT standards.

* * * * *

§ 154.740 [Amended]

6. In § 154.740—

a. In paragraph (g), remove the reference "subpart E" and add, in their place, the reference "subpart P"; and

b. In paragraph (i), remove the reference "§ 154.804 of this part" and add, in their place, the reference "33 CFR 154.2023".

7. Remove subpart E (consisting of §§ 154.800 through 154.850) in its entirety.

8. Reserve subparts J through O.

9. Add new subpart P to read as follows:

Subpart P—Marine Vapor Control Systems

General

Sec.

154.2000 Applicability.

154.2001 Definitions.

Certifying Entities

154.2010 Qualifications for acceptance as a certifying entity.

154.2011 Application for acceptance as a certifying entity.

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General

§ 154.2000 Applicability.

(a) Except as specified by paragraphs (b) through (g) of this section, this subpart applies to—

(1) Each facility that controls vapors emitted to or from vessel cargo tanks;

(2) A vessel, other than a tank vessel, that has a vapor processing unit located onboard for recovery, destruction, or dispersion of vapors from a tank vessel's cargo tanks;

(3) Certifying entities that review, inspect, test, and certificate facility vapor control systems (VCSs); or

(4) A facility VCS that receives cargo vapor from a vessel when the VCS is connected to a facility's main VCS that serves plant processing areas, such as tank storage areas or tank truck or railcar loading areas, unrelated to tank vessel operations. The requirements of this subpart apply between the vessel vapor connection and the point where the VCS connects to the facility's main VCS.

(b) Each facility that has an existing certified VCS that meets the requirements of this subpart and that has been operating since July 23, 1990, must comply with this amended subpart by [DATE THREE YEARS AFTER EFFECTIVE DATE OF FINAL RULE].

(c) A facility with a Coast Guard-approved VCS operating prior to July 23, 1990, must comply with 33 CFR 154.2150 but otherwise need not comply with this subpart so long as it does not have any design or configuration alterations after its approval and receives cargo vapor only from the specific vessels for which it was originally approved.

(d) A facility that uses a vapor balancing system to transfer vapor from a railcar or a tank truck to a vessel cargo tank while offloading the vessel must have approval from the Commandant.

(e) A facility that transfers vapor from a facility tank to a cargo tank of a vessel which is not offloading cargo must have approval from the Commandant.

(f) A tank vessel that has a permanent or portable vapor processing unit located onboard must meet the requirements of this subpart to the satisfaction of the Commandant, in addition to complying with the requirements of 46 CFR part 39.

(g) This subpart does not apply to the collection of vapors of liquefied flammable gases as defined in 46 CFR 30.10–39.

(h) This subpart does not require a facility or a vessel to control vapor, or a vessel to take away vapor from facilities; however, if a facility operates a VCS to control vapor to or from vessels, the facility must comply with the requirements of this subpart.

(i) In this subpart, regulatory measurements, whether in the metric or English system, are sometimes followed by approximate equivalent measurements in parentheses, which are given solely for the reader's convenience. Regulatory compliance with the regulatory measurement is required.

§ 154.2001 Definitions.

As used in this subpart only:

Ambient temperature means the temperature of the environment in which an experiment is conducted or in which any physical or chemical event occurs.

Barge cargo connection means the point in a barge's cargo system where it connects with the hose assembly or loading arm used for cargo transfer.

Barge vapor connection means the point in a barge's piping system where it connects to a vapor collection hose or arm. This may be the same as the barge's cargo connection as it controls vapors during barge cargo tank-cleaning operations.

Base loading means a method of inerting, enriching, or diluting such that sufficient inerting, enriching, or diluting gas, for the worst concentration of vapor coming from the vessel, is injected into the vapor line during the entire loading operation so that the vapor mixture is inerted, enriched, or diluted at the maximum loading rate. For inerting and enriching systems, "worst concentration" means the vapor stream contains no cargo vapor. For a diluting system, "worst concentration" means the vapor stream is saturated with cargo vapor.

Captain of the Port (COTP) means the cognizant Coast Guard Captain of the Port as defined in 33 CFR 154.105.

Certifying entity means an individual or organization accepted by the Commandant to review plans, data, and calculations for vapor control system designs and to conduct inspections and witness tests of vapor control system installations.

Cleaning operation means any stripping, gas-freeing, or tank-washing operation of a barge's cargo tanks conducted at a cleaning facility.

Combustible liquid means any liquid that has a flashpoint above 80 °F (as determined from an open-cup tester, as used to test burning oils) and includes Grade D and Grade E combustible liquids defined in 46 CFR 30.10–15.

Commandant means Commandant (CG–522), U.S. Coast Guard, 2100 2nd St., SW., Stop 7126, Washington, DC 20593–7126.

Detonation arrester means a device that is acceptable to the Commandant and includes a detonation arrester that is designed, built, and tested in accordance with Appendix A of this part or by another method acceptable to the Commandant for arresting flames and detonations.

Diluting means introducing a non-flammable and non-combustible gas with the objective of reducing the hydrocarbon content of a vapor mixture to below the lower flammable limit so that it will not burn.

Drip leg means a section of piping that extends below piping grade to collect liquid passing through the vapor line and that has a diameter no more than the diameter of the pipe in which it is installed.

Elevated temperature means the temperature that exceeds 70 percent of the auto-ignition temperature, in degrees Celsius, of the vapors being collected.

Enriching means introducing a flammable gas with the objective of raising the hydrocarbon content of a vapor mixture above the upper flammable limit so that it will not burn.

Existing vapor control system means a vapor control system that satisfies the requirements of this subpart as certified by a certifying entity prior to [EFFECTIVE DATE OF FINAL RULE].

Facility main vapor control system means a vapor control system that primarily serves plant processing areas unrelated to tank vessel operations, such as the refinery process, tank storage areas, or tank truck or railcar loading areas.

Facility operations manual means the manual required by 33 CFR 154.300, the contents of which are described in 33 CFR 154.310.

Facility vapor connection means the point in a facility's vapor collection system where it connects to a vapor collection hose or the base of a vapor collection arm and is located at the dock

as close as possible to the tank vessel to minimize the length of the flexible vapor collection hose, thus reducing the hazards associated with the hose.

Fail-safe means a piece of equipment or instrument that is designed such that if any element should fail, it would go to a safe condition.

Fixed stripping line means a pipe extending to the low point of each cargo tank, welded through the deck and terminating above the deck with a valve plugged at the open end.

Flammable liquid means any liquid that gives off flammable vapors (as determined by flashpoint from an open-cup tester, as used to test burning oils) at or below a temperature of 80 °F, and includes Grades A, B, and C flammable liquids defined in 46 CFR 30.10–22.

Flame arrester means a device that is designed, built, and tested in accordance with ASTM F 1273 or UL 525 (both incorporated by reference, *see* 33 CFR 154.106) for use in end-of-line applications for arresting flames.

Flame screen means a fitted single screen of corrosion-resistant wire of at least 30-by-30 mesh, or two fitted screens, both of corrosion-resistant wire, of at least 20-by-20 mesh, spaced apart not fewer than 12.7 millimeters (0.5 inch) or more than 38.1 millimeters (1.5 inches).

Fluid displacement system means a system that removes vapors from a barge's cargo tanks during gas freeing through the addition of an inert gas or other medium into the cargo tank.

Fluid injection connection means the point in a fluid displacement system at which the fixed piping or hose that supplies the inert gas or other medium connects to a barge's cargo tanks or fixed piping system.

Gas freeing means the removal of vapors from a tank barge.

Grade A, B, C, D, or E means any Grade A, B, or C flammable liquid defined in 46 CFR 30.10–22 or any Grade D or E combustible liquid defined in 46 CFR 30.10–15.

High flash point cargoes means Grade E cargoes and cargoes having a closed-cup flash point higher than 60 °C (140 °F), carried at a temperature no higher than 5 °C (9 °F) below their flash points.

Inerted means the oxygen content of the vapor space in a tank vessel's cargo tank is reduced to 60 percent or less by volume of the vapor's minimum oxygen concentration for combustion, or to 8 percent by volume or less for the vapor of crude oil, gasoline blends, or benzene, by addition of an inert gas, in accordance with the inert gas requirements of 46 CFR 32.53 or 46 CFR 153.500.

Inerting or *padding* or *purging* means introducing an inert gas to lower the oxygen content of a vapor mixture.

Line clearing or *pigging* means the transfer of residual cargo from a cargo loading line by using compressed gas to propel a "pig" through the line toward a cargo tank.

Liquid knockout vessel means a device, other than a drip leg, used to separate liquid from vapor.

Maximum allowable gas-freeing rate means the maximum volumetric rate at which a barge may be gas-freed during cleaning operations.

Maximum allowable stripping rate means the maximum volumetric rate at which a barge may be stripped during cleaning operations prior to the opening of any hatch and/or fitting in the cargo tank being stripped.

Maximum allowable transfer rate means the maximum volumetric rate at which a vessel may receive cargo or ballast.

Minimum oxygen concentration for combustion or *MOCC* means the lowest level of oxygen in a vapor or a vapor mixture that will support combustion.

Multi-breasted barge-loading operations are those in which barges load side by side with the outboard barge's vapor collection system connected to a facility vapor connection through the inboard barge, as opposed to single-breasted operations involving a single barge.

Multiple facility vapor collection system junction means the point in the vapor collection system where two or more branch lines originating from separate facility vapor connections are connected.

New vapor control system means a vapor control system that is not an existing vapor control system.

Padded or *partially inerted* means the oxygen content of the vapor space in a tank is reduced to below what is normally present in the atmosphere by the addition of an inert gas such as nitrogen or carbon dioxide, but not to the concentration that meets the definition of "inerted" in this section.

Pig means any device designed to maintain a tight seal within a cargo line while being propelled by compressed gas towards a cargo tank, for the purpose of transferring residual cargo from the cargo loading line to the cargo tank.

Pre-transfer conference means the conference required by 33 CFR 156.120(w).

Stripping means the removal, to the maximum extent practicable, of cargo residue remaining in the barge's cargo tanks and associated fixed piping system after cargo transfer or during cleaning operations.

Tank barge cleaning facility or *TBCF* means a facility used or capable of being used to conduct cleaning operations on a tank barge.

Transfer facility means a facility as defined in 33 CFR 154.105, excluding tank barge cleaning or stripping facilities.

Vacuum displacement system means a system that removes vapors from a barge's cargo tanks during gas freeing by sweeping air through the cargo tank hatch openings.

Vapor balancing means the transfer of vapor displaced by incoming cargo from the tank of a vessel or facility receiving cargo into a tank of the vessel or facility delivering cargo via facility vapor collection system.

Vapor collection system means an arrangement of piping and hoses used to collect vapor emitted to or from a vessel's cargo tanks and to transport the vapor to a vapor processing unit or a tank.

Vapor control system or *VCS* means an arrangement of piping and equipment used to control vapor emissions collected to or from a vessel and includes the vapor collection system and the vapor processing unit or a tank.

Vapor destruction unit means a vapor processing unit that destroys cargo vapor by a thermal destruction method.

Vapor dispersion unit means a vapor processing unit that releases cargo vapor into the atmosphere through a venting system not located on the tank vessel.

Vapor processing unit means the components of a vapor control system that recover, destroy, or disperse vapor collected from a vessel.

Vapor recovery unit means a vapor processing unit that recovers cargo vapor by nondestructive means.

Vessel vapor connection means the point in a vessel's fixed vapor collection system where it connects to a vapor collection hose or arm.

Certifying Entities

§ 154.2010 Qualifications for acceptance as a certifying entity.

To qualify for acceptance as a vapor control system (VCS) certifying entity, the entity must demonstrate to the satisfaction of the Commandant that it possesses the following minimum qualifications:

(a) The ability to review and evaluate design drawings and failure analyses for compliance to this subpart;

(b) The knowledge of the applicable regulations of this subpart, including the standards incorporated by reference;

(c) The ability to monitor and evaluate test procedures and results for compliance with the operational requirements of this subpart;

(d) The ability to perform inspections and witness tests of bulk liquid cargo-handling systems;

(e) That the applicant is not controlled by an owner or operator of a vessel or facility engaged in controlling vapor emissions;

(f) That the applicant is not dependent upon Coast Guard acceptance under this section to remain in business; and

(g) That the person in charge of VCS certification is currently a licensed professional engineer.

§ 154.2011 Application for acceptance as a certifying entity.

(a) An applicant seeking Coast Guard acceptance as a certifying entity of vapor control systems (VCSs) must submit a signed, written application to the Commandant. The applicant's signature certifies that the information in the application is true and that the applicant is not dependent upon Coast Guard acceptance under this section to remain in business and constitutes consent for the Coast Guard to verify any information contained in the application, through personal examination of persons named in the application, or otherwise. If an applicant knowingly and willfully provides any false statement or misrepresentation, or conceals a material fact in the application, the application may be denied or terminated, and the applicant may be subject to prosecution under the provisions of 18 U.S.C. 1001.

(b) An application must include the following general information:

(1) The name and address of the applicant, including subsidiaries and divisions if applicable;

(2) A description of the experience and qualifications of any person who would review or test systems on behalf of the applicant, showing that the person is familiar with or otherwise qualified to implement Coast Guard VCS regulations; and

(3) A letter from a facility owner or operator stating his or her intent to use the services of the applicant to certify VCS installations.

(c) The Commandant reviews each application and either issues a letter of acceptance as a certifying entity to the applicant, or notifies the applicant that it is not accepted, and maintains a list of currently accepted certifying entities that is available to the public at *http://homeport.uscg.mil.*

(d) The acceptance of a certifying entity may be terminated by the Commandant for failure to review, inspect, or test a system properly in accordance with this subpart.

(e) A certifying entity may not certify a facility VCS if that certifying entity was involved in the design or installation of the system. "Design or installation" includes but is not limited to—

(1) Performing calculations;

(2) Providing chemical data;

(3) Developing plans, specifications, and drawings;

(4) Conducting failure analysis; and

(5) Installing systems or components.

(f) A certifying entity may not conduct the failure analysis of a facility VCS it is certifying. The certifying entity may only point out shortcomings shown by the failure analysis and may not propose changes to correct the shortcomings.

(g) A certifying entity may not certify the VCS of any vessel or facility owner or operator that owns or has a controlling interest in the certifying entity.

Certification, Recertification, and Operational Review

§ 154.2020 Certification and recertification—Owner/operator responsibilities.

(a) Prior to operating, a new vapor control system (VCS) installation must be certified under 33 CFR 154.2023 by a certifying entity as meeting the requirements of this subpart.

(b) A certified VCS or a Coast Guard-approved VCS that was operating prior to July 23, 1990 must be recertified by a certifying entity under 33 CFR 154.2023 before it can—

(1) Control vapors other than those for which it was originally certified;

(2) Receive vapors from vessels other than those for which it was approved, if the VCS was in operation prior to July 23, 1990;

(3) Operate under any changed design or configuration;

(4) Operate as part of multi-breasted barge-loading operations, if the VCS was not originally approved or certified for such operations; or

(5) Be connected to a tank vessel if a cargo line clearance system is used to clear cargo in the cargo line back to the tank vessel.

(c) Prior to operating a VCS to control vapor from a tank vessel during cargo line clearing if a cargo line clearance system is used to clear cargo in the cargo line back to the tank vessel, the cargo line clearance system must be reviewed by a certifying entity as meeting the requirements of 33 CFR 154.2104.

(d) To apply for certification, the owner or operator of a facility VCS must submit plans, calculations, specifications, and other related information, including a qualitative failure analysis, to the certifying entity. Suggested guidance for preparing qualitative and optional quantitative failure analyses can be obtained from *http://homeport.uscg.mil.* The analysis must demonstrate that—

(1) The VCS can operate continuously and safely while controlling cargo vapors to or from tankships or tank barges over the full range of transfer rates expected at the facility;

(2) The VCS has the proper alarms and automatic shutdown systems required by this subpart to prevent an unsafe operation;

(3) The VCS has sufficient automatic or passive devices to minimize damage to personnel, property, and the environment if an accident were to occur;

(4) If a quantitative failure analysis is also conducted, the level of safety attained is at least one order of magnitude greater than that calculated for operating without a VCS; and

(5) If a facility uses a cargo line clearance system to clear cargo in the cargo line back to the tank vessel with the VCS connected, the qualitative failure analysis must demonstrate that the cargo line clearance system has at least the same levels of safety required by paragraphs (d)(1), (d)(2), and (d)(3) of this section to prevent overpressure of the vessel's cargo tanks and account for the probability that the pig is destroyed during line-clearing operations.

(e) The VCS owner or operator must maintain at the facility—

(1) A copy of VCS design documentation, including plans, drawings, calculations, and specifications for the VCS;

(2) The facility operations manual, including the list of cargoes that the facility is approved to vapor control; and

(3) Any certification or recertification letter issued under 33 CFR 154.2023.

§ 154.2021 Operational review—Owner/operator responsibilities.

(a) Each facility vapor control system (VCS) must undergo an operational review by a certifying entity within three years of its initial certification or last operational review, to ensure its proper operation and maintenance.

(b) The VCS owner or operator must coordinate with the certifying entity and provide the entity with all necessary documentation and records to conduct the operational review.

(c) The VCS owner or operator must notify the Captain of the Port (COTP) of

a scheduled operational review. The COTP, at his or her discretion, may witness the operational review.

(d) The VCS owner or operator must maintain, at the facility, the latest operational review letter issued under 33 CFR 154.2023.

§ 154.2022 Certification, recertification, or operational review—Certifying entity responsibilities, generally.

(a) Before certifying or recertifying a facility vapor control system (VCS), the certifying entity must—

(1) Review all VCS design documentation, including plans, drawings, calculations, specifications, and failure analysis, to ensure that the VCS design meets the requirements of this subpart;

(2) Review all chemical data in accordance with paragraph (c) of this section, to confirm that the VCS is properly designed for controlling each specific chemical vapor;

(3) Conduct an initial onsite inspection to ensure that the VCS installation conforms to the VCS plans, drawings, and specifications reviewed;

(4) Conduct onsite reviews and witness tests in accordance with paragraph (d) of this section, to ensure the VCS's proper operation in accordance with its design and compliance with applicable regulations and the facility's operations manual;

(5) Review, inspect, and witness tests of all design or configuration alterations before recertifying a VCS that was certified or approved for operation prior to July 23, 1990, to ensure that the altered system complies with applicable regulations;

(6) Review the VCS design in accordance with paragraph (e) of this section, prior to recertifying the VCS for the control of additional cargo vapors;

(7) Review the VCS in accordance with paragraph (f) of this section, prior to certifying or recertifying it to control vapors from barge cargo tanks during multi-breasted barge-loading operations;

(8) Review a cargo line clearance system as meeting the requirements of 33 CFR 154.2104 if such a system is used to clear cargo in the cargo line back to a tank vessel prior to certifying or recertifying a VCS to control vapor from the tank vessel during cargo line clearance operations; and

(9) Review the facility operations manual to ensure that it meets the requirements of 33 CFR 154.310(b).

(b) In conducting an operational review to ensure that the VCS is properly operating and maintained, the certifying entity must ensure, at a minimum—

(1) The completeness, currency, and accuracy of the facility operations manual, training plans, and VCS test procedures;

(2) Proper maintenance and operation of VCS components, through visual inspection; and

(3) That cargo transfer or tank-cleaning barge operational procedures are properly followed and the VCS operates properly, through observation of the initial stages of transfer or cleaning, including 24-hour pre-transfer tests required by 33 CFR 154.2150(b) or 33 CFR 154.2250(b), the pre-transfer conference, and initial system startup procedures.

(c) For each of the following, if applicable, the certifying entity's review of chemical data must ensure that—

(1) Each chemical's maximum experimental safe gap, minimum oxygen concentration for combustion (MOCC), and upper and lower limits of flammability have been correctly determined, which may be determined using Coast Guard guidance available at *http://homeport.uscg.mil*;

(2) Each detonation arrester used in the VCS is correct for each chemical's maximum experimental safe gap;

(3) Setpoints for each oxygen analyzer used in the VCS are correct for each chemical's MOCC;

(4) Setpoints for each oxygen or hydrocarbon analyzer used in the VCS are correct for each chemical's upper or lower flammability limit;

(5) Each vapor-controlled chemical is compatible with other chemicals and with inerting, enriching, or diluting gases added to the VCS per 46 CFR part 150, Table I and Table II;

(6) Each vapor-controlled chemical is compatible with all VCS components;

(7) Each vapor-controlled chemical is listed in one of the following: 46 CFR part 30, Table 30.25–1; 46 CFR part 151, Table 151.05; 46 CFR part 153, Table 1 and Table 2; or as specified in writing by the Commandant;

(8) The flash point for any cargo with a closed-cup flash point of 60 °C (140 °F) or higher is properly determined;

(9) Any test program used for instrument testing and calibration conforms with 33 CFR 154.2180 and 33 CFR 154.2181; and

(10) Any calculation to determine the duration of purging required by 33 CFR 154.2150(o) is correct.

(d) The certifying entity must ensure—

(1) That each alarm and shutdown, shown on the piping and instrumentation diagrams and reviewed in the hazard analysis as part of the system, responds properly, through simulation of emergency conditions to activate the alarm or shutdown;

(2) That maximum vacuum can be maintained at the maximum operating conditions of any vapor-moving device, through testing of the vacuum breaker;

(3) That VCS shutdown occurs correctly, through the startup of the VCS and tripping of each shutdown loop while the VCS is not connected to a vessel;

(4) That VCS startup, normal operation, and shutdown occur properly, through witnessing the relevant portions of a test loading or unloading of one vessel, or a test cleaning of one tank barge at a tank barge cleaning facility; and

(5) That the automatic liquid block valve successfully stops flow of liquid to the vessel during a system shutdown, through witnessing the relevant portions of a test loading or test cargo tank cleaning.

(e) Prior to recertifying the VCS for the control of additional cargo vapors, the certifying entity must review the VCS design to ensure that, with respect to each additional vapor, the—

(1) System complies with 33 CFR 154.2103(a) and (b) or 33 CFR 154.2203(a) and (b);

(2) Inerting, enriching, or diluting system is adequate;

(3) Vapor recovery or destruction unit is adequate;

(4) Mechanical equipment and systems are suitable;

(5) Vapor properties and characteristics are addressed, including freezing point, polymerization potential, solubility, and cargo compatibility;

(6) VCS's failure analysis addresses any new hazards presented; and

(7) Facility operations manual's VCS addendum has been modified to list each additional vapor.

(f) Prior to certifying or recertifying a VCS to control vapors from barge cargo tanks during multi-breasted barge-loading operations, the certifying entity must confirm that—

(1) The overfill control system required by 33 CFR 154.2102 will process a liquid overfill condition within any one cargo tank on each barge;

(2) If multi-breasted loading is conducted using more than one liquid transfer hose from the shore facility, the facility is capable of activating the emergency shutdown system required by 33 CFR 154.550, and can automatically stop the cargo flow to each transfer hose simultaneously, in the event an upset condition occurs that closes the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a);

(3) The facility operations manual has been modified to include the procedures for multi-breasted barge-loading operations; and

(4) The facility operations manual describes how to make proper connections, on the facility side, between the alarm and shutdown systems of the VCS and of each barge being loaded.

§ 154.2023 Certification, recertification, or operational review—Certifying entity documentation.

(a) If the certifying entity is satisfied that the facility's vapor control system (VCS) has successfully undergone the reviews, inspections, and tests required by 33 CFR 154.2022(a) for certification or recertification, and that the VCS will operate properly and safely, the certifying entity must certify or recertify the VCS by issuing a certification letter to the facility owner or operator, and by sending copies of the letter to the Captain of the Port (COTP) and the Commandant. The certification letter must refer by date to the certifying entity's letter of acceptance issued under 33 CFR 154.2011(c), and must—

(1) State that the facility complies with applicable regulations and with its operations manual, and list any exemptions to the applicable regulations that have been approved by the Coast Guard;

(2) Report on all reviews, inspections, and tests undergone by the VCS in accordance with 33 CFR 154.2022(a);

(3) List all plans and drawings that were reviewed by the certifying entity;

(4) State if the VCS may control vapors from tank barges that are required to have a shore-side, explosion-proof receptacle or an overfill control system required by 33 CFR 154.2102(a) and (b); and

(5) List all cargoes that the certifying entity approves for control by the VCS.

(b) If the certifying entity is satisfied that the facility's VCS has successfully undergone the operational review required by 33 CFR 154.2022(b), the certifying entity must issue an operational review letter to the facility owner or operator, and send copies of the letter to the COTP and the Commandant. The operational review letter must—

(1) List each item reviewed and inspected;

(2) Describe the transfer or cleaning operation observed; and

(3) Summarize the review's results.

Personnel

§ 154.2030 Transfer facilities.

(a) Personnel in charge of a transfer operation using a vapor control system (VCS) must have completed a training program covering the particular VCS installed at the facility. As part of the training program, personnel must be able to demonstrate, through drills and display of practical knowledge, the proper VCS operational procedures for normal and emergency conditions. The training program must cover the following subjects:

(1) Purpose of the VCS;

(2) Principles of the VCS;

(3) Components of the VCS;

(4) Hazards associated with the VCS;

(5) Coast Guard regulations in this subpart;

(6) Operating procedures, including:

(i) Transfer, testing, and inspection requirements;

(ii) Pre-transfer procedures;

(iii) Chemicals approved for collection;

(iv) Material safety data sheet review;

(v) Connection procedures;

(vi) Startup procedures;

(vii) Normal operating conditions and how to handle deviations from normal conditions;

(viii) Normal shutdown procedures; and

(ix) Operating procedures for cargo line clearing if a cargo line clearance system is installed in accordance with 33 CFR 154.2104; and

(7) Emergency procedures.

(b) Personnel overseeing VCS maintenance must be familiar with—

(1) Inspection of detonation arresters; and

(2) Procedures for equipment and instrumentation testing required by 33 CFR 156.170(g).

§ 154.2031 Tank barge cleaning facilities.

(a) In addition to complying with 33 CFR 154.2030, a tank barge cleaning facility (TBCF) person in charge of a barge cargo tank-cleaning operation that uses a vapor control system (VCS) must complete a training program covering the particular systems installed at the facility and on the barge. As part of the training program, personnel must be able to demonstrate, through drills and practical knowledge, the proper VCS operation procedures for normal and emergency conditions. The training program must—

(1) Satisfy the requirements of 33 CFR 154.2030(a)(1) through (a)(7) and 33 CFR 154.2030(b) and cover—

(i) Purpose, principles, components, and hazards associated with stripping and gas-freeing;

(ii) Special hazards associated with the accumulation and discharge of static electricity; and

(iii) Operating procedures, including pre-cleaning procedures, and safeguards to prevent static electricity discharge.

(b) In addition to the requirements contained in 33 CFR 154.710, no person may serve, and the facility operator may not use the services of anyone, as a facility person in charge of a cleaning operation unless the person has been properly trained and certified by the facility with a minimum of 60 hours of experience in cleaning operations.

Transfer Facilities—VCS Design and Installation

§ 154.2100 Vapor control system, general.

(a) Vapor control system (VCS) design and installation must eliminate potential overpressure and vacuum hazards, overfill hazards, sources of ignition, and mechanical damage to the maximum practicable extent. Each remaining hazard source that is not eliminated must be specifically addressed in the protection system design and system operational requirements.

(b) Vapor collection system pipe and fitting components must be in accordance with ANSI B31.3 (incorporated by reference, *see* 33 CFR 154.106) with a maximum allowable working pressure (MAWP) of at least 150 pounds per square inch gauge (psig). Valves must be in accordance with ANSI B16.34, 150 pound class (incorporated by reference, *see* 33 CFR 154.106). Flanges must be in accordance with ANSI B16.5 or B16.24, 150 pound class (both incorporated by reference, *see* 33 CFR 154.106). The following components and their associated equipment do not have a minimum specified MAWP, but must be constructed to acceptable engineering standards and have the appropriate mechanical strength to serve the intended purpose: Knockout drums, liquid seals, blowers/compressors, flare stacks/incinerators, and other vapor processing units.

(c) All VCS electrical equipment must comply with NFPA 70 (incorporated by reference, *see* 33 CFR 154.106).

(d) Any pressure, flow, or concentration indication required by this part must provide a remote indicator on the facility where the cargo transfer system and VCS are controlled, unless the local indicator is clearly visible and readable from the operator's normal position at the control stations.

(e) Any condition requiring an alarm as specified in this part must activate an audible and visible alarm where the cargo transfer and VCSs are controlled.

(f) For a VCS installed after [EFFECTIVE DATE OF FINAL RULE], an alarm or shutdown must be activated if electrical continuity of an alarm or shutdown sensor required by this subpart is lost.

(g) The VCS piping surface temperature must not exceed 177 °C

(350 °F) or 70 percent of the auto-ignition temperature in degrees Celsius of the vapors being transferred, whichever is lower, during normal operations. This must be achieved by either separating or insulating the entire VCS from external heat sources.

(h) The VCS must be equipped with a mechanism to eliminate any liquid condensate from the vapor collection system that carries over from the vessel or condenses as a result of an enrichment process.

(1) If a liquid knockout vessel is installed to eliminate any liquid condensate, it must have—

(i) A mechanism to indicate the level of liquid in the device;

(ii) A high liquid level sensor that activates an alarm, meeting the requirements of paragraph (e) of this section;

(iii) A high-high liquid level sensor that closes the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a), and shuts down any vapor-moving devices before carrying liquid over from the vessel to the vapor-moving device. One sensor with two stages may accomplish both this requirement and the requirement of paragraph (h)(1)(ii) of this section; and

(2) If a drip leg is used to eliminate any liquid condensate, a mechanism to remove liquid from the low point.

(i) Vapor collection piping must be electrically grounded and must be electrically continuous.

(j) If the facility handles inerted vapors of cargoes containing sulfur, the facility must control heating from pyrophoric iron sulfide deposits in the vapor collection line.

(k) All VCS components, including piping, hoses, and gaskets, must be suitable for use with the vapor in the VCS.

§ 154.2101 Requirements for facility vapor connections.

(a) A remotely operated cargo vapor shutoff valve must be installed in the vapor collection line between the facility vapor connection and the nearest point where any inerting, enriching, or diluting gas is introduced into the vapor collection line, or where a detonation arrester is fitted. The valve must—

(1) Close within 30 seconds after detection of a shutdown condition of any component required by this subpart;

(2) Close automatically if the control signal or electrical power to the system is interrupted;

(3) Activate an alarm meeting 33 CFR 154.2100(e) when a signal to shut down is received from a component;

(4) Be capable of manual operation or manual activation;

(5) Have a local valve position indicator, or be designed so that the valve position can be readily determined from the valve handle or valve stem position; and

(6) If the valve seat is fitted with resilient material, be a Category A valve as defined by 46 CFR 56.20–15 and not allow appreciable leakage when the resilient material is damaged or destroyed.

(b) Except when a vapor collection arm is used, the first 1 meter (3.3 feet) of vapor piping downstream of the facility vapor connection must be—

(1) Painted in the sequence of red/yellow/red. The width of the red bands must be 0.1 meter (0.33 foot) and the width of the middle yellow band must be 0.8 meter (2.64 feet); and

(2) Labeled with the word "VAPOR" painted in black letters at least 50.8 millimeters (2 inches) high.

(c) Each facility vapor connection flange face must have a permanent stud projecting outward that is 12.7 millimeters (0.5 inch) in diameter and is at least 25.4 millimeters (1 inch) long. It must be located at the top of the flange face, midway between boltholes, and in line with the bolthole pattern.

(d) Each hose that transfers vapors must—

(1) Have a design burst pressure of at least 25 pounds per square inch gauge (psig);

(2) Have a maximum allowable working pressure no less than 5 psig;

(3) Be capable of withstanding at least a 2 pounds per square inch (psi) vacuum without collapsing or constricting;

(4) Be electrically continuous with a maximum resistance of 10,000 ohms;

(5) Have flanges with—

(i) A bolthole arrangement complying with the requirements for 150 pound class flanges, ANSI B16.5 (incorporated by reference, *see* 33 CFR 154.106); and

(ii) One or more 15.9 millimeter (0.625 inch) diameter holes in the flange face, located midway between boltholes, and in line with the bolthole pattern;

(6) Be resistant to abrasion and kinking;

(7) Be compatible with vapors being controlled; and

(8) Have the last 1 meter (3.3 feet) of each end of the vapor hose marked in accordance with paragraph (b) of this section.

(e) Vapor hoses must be adequately supported to prevent kinking, collapse, or contact with metal surfaces on the dock during loading or offloading.

(f) Fixed vapor collection arms must—

(1) Meet the requirements of paragraphs (d)(1) through (d)(5) of this section; and

(2) Have the last 1 meter (3.3 feet) of the arm marked in accordance with paragraph (b) of this section.

(g) The facility vapor connection must be electrically insulated from the vessel vapor connection in accordance with OCIMF ISGOTT section 17.5 (incorporated by reference, *see* 33 CFR 154.106). In order to prevent electrical arcing during connection and disconnection of the transfer hose/arm, the transfer hose/arm must be fitted with an insulating flange or a single length of non-conducting hose to ensure electrical discontinuity between the vessel and facility. The insulating flange/hose must not be electrically bypassed.

(h) A vapor collection system, fitted with a gas injection system that operates at a positive gauge pressure at the facility vapor connection, must be fitted with a mechanism to prevent backflow of vapor to the vessel's vapor collection system during loading.

§ 154.2102 Facility requirements for vessel liquid overfill protection.

This section does not apply to facilities collecting vapors emitted from vessel cargo tanks while inerting the cargo tanks.

(a) Each facility that receives cargo vapor from a tank barge that is fitted with overfill protection, in accordance with 46 CFR 39.2009(a)(1)(iii), must provide a 120-volt, 20-amp explosion-proof receptacle for the overfill protection system that meets—

(1) NEMA WD–6 (incorporated by reference, *see* 33 CFR 154.106);

(2) NFPA 70, National Electrical Code, 2002, Articles 410–57 and 501–12 (incorporated by reference, *see* 33 CFR 154.106); and

(3) 46 CFR 111.105–9.

(b) Each facility that receives cargo vapor from a tank barge that is fitted with an intrinsically safe cargo tank level sensor system complying with 46 CFR 39.2009(b), as a means of overfill protection, must have an overfill control system on the dock capable of powering and receiving an alarm and shutdown signal from the cargo tank level sensor system that—

(1) Closes the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a) and activates the emergency shutdown system required by 33 CFR 154.550 when—

(i) A tank overfill signal is received from the barge; or

(ii) Electrical continuity of the cargo tank level sensor system is interrupted;

(2) Activates an audible and visible alarm that warns barge and facility personnel when a tank overfill signal, or an optional high-level signal

corresponding to a liquid level lower than the tank overfill sensor setting, is received from the barge;

(3) Has a mechanism to test the alarms and automatic shutdown systems electrically and mechanically before operating the vapor control system (VCS);

(4) Has suitable means, such as approved intrinsic safety barriers able to accept passive devices, so that the overfill and optional alarm circuits on the barge side of the overfill control system, including cabling, normally closed switches, and pin and sleeve connectors, are intrinsically safe;

(5) Is labeled at the dock with the maximum allowable inductance (in millihenrys) and capacitance (in microfarads) to be connected to the facility overfill protection system as specified by the equipment manufacturer; and

(6) Has a female connecting plug for the tank barge level sensor system with a five-wire, 16-ampere connector body meeting IEC 60309–1 and IEC 60309–2 (both incorporated by reference, *see* 33 CFR 154.106), which is—

(i) Configured with pins S2 (N) and R1 (L3) for the tank overfill sensor circuit, pin G connected to the cabling shield, and pins N (L2) and T3 (L1) reserved for an optional high-level alarm connection;

(ii) Labeled "Connector for Barge Overfill Control System"; and

(iii) Connected to the overfill control system by a shielded flexible cable.

§ 154.2103 Facility requirements for vessel vapor overpressure and vacuum protection.

In this section, the requirements of having a flame arrester or a flame screen at the opening of a pressure relief valve or a vacuum relief valve apply only to facilities collecting vapors of flammable, combustible, or non-high flash point liquid cargoes.

(a) A facility's vapor control system (VCS) must have the capacity for collecting cargo vapor at a rate of not less than the facility's maximum liquid transfer rate for cargoes that are vapor controlled plus the vapor growth for the cargoes and any inerting, diluting, or enriching gas that may be added to the system. Vapor growth must be considered as 25 percent of the cargo's true vapor pressure in pounds per square inch absolute (psia) at 115 °F, divided by the vapor pressure of gasoline at 115 °F (12.5 psia), unless there is experimental data for actual vapor growth for turbulent transferring under the most severe conditions for vapor growth. If the cargo is transferred at temperatures above 115 °F, the cargo's true vapor pressure (in psia) at the transferring temperature must be used when determining the vapor growth.

(b) A facility VCS must be designed to prevent the pressure in a vessel's cargo tanks from going below 80 percent of the highest setting of any of the vessel's vacuum relief valves or exceeding 80 percent of the lowest setting of any of the vessel's pressure relief valves for a non-inerted tank vessel. A facility VCS also must be designed to prevent the pressure in a vessel's cargo tanks from going below 0.2 pounds per square inch gauge (psig) or exceeding 80 percent of the lowest setting of any of the vessel's pressure relief valves for an inerted tank vessel. The system must sustain the pressure in the vessel's cargo tanks within this range at any cargo transfer rate less than or equal to the maximum transfer rate determined at the pre-transfer conference.

(c) The pressure measured at the facility vapor connection must be corrected for pressure drops across the vessel's vapor collection system, vapor collection hose or arm, and vapor line up to the location of the pressure sensor.

(d) The facility vapor connection must have a pressure-sensing device that meets the installation requirements of paragraph (h) of this section, which activates an alarm that meets 33 CFR 154.2100(e) when the pressure at the facility vapor connection exceeds either—

(1) The pressure corresponding to the upper pressure determined in paragraph (b) of this section; or

(2) A lower pressure agreed upon at the pre-transfer conference.

(e) If a facility draws vapor from a vessel with a vapor-moving device, the facility vapor connection must have a pressure-sensing device, which activates an alarm meeting 33 CFR 154.2100(e) when the pressure at the facility vapor connection falls below either—

(1) The pressure corresponding to the lower pressure determined in paragraph (b) of this section; or

(2) A higher pressure agreed upon at the pre-transfer conference.

(f) The facility vapor connection must have a pressure-sensing device, independent of the device used to activate the alarm required by paragraph (d) of this section, meeting the installation requirements of paragraph (h) of this section, which activates the emergency shutdown system required by 33 CFR 154.550 when the pressure at the facility vapor connection exceeds the lower of the following:

(1) A pressure corresponding to 90 percent of the vessel's lowest pressure relief valve setting, corrected for pressure drops across the vessel's vapor collection system, the vapor collection hose or arm, and any vapor line up to the point where the pressure sensor is located;

(2) A pressure corresponding to 90 percent of the setting of the pressure relief valve at the facility vapor connection, if the facility vapor connection is installed with a pressure relief valve; or

(3) A lower pressure than the pressure in paragraphs (f)(1) and (f)(2) of this section that is agreed upon at the pre-transfer conference.

(g) If a facility draws vapors from a vessel with a vapor-moving device, the facility vapor connection must have a pressure-sensing device, independent of the device used to activate the alarm required by paragraph (e) of this section, which closes the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a) when the vacuum at the facility vapor connection is more than the higher (lesser vacuum) of the following:

(1) A vacuum corresponding to 90 percent of the vessel's highest vacuum relief valve setting;

(2) A vacuum corresponding to 90 percent of the setting of the vacuum relief valve at the facility vapor connection, if the facility vapor connection is installed with a vacuum relief valve; or

(3) A lesser vacuum than the vacuum in paragraphs (g)(1) and (g)(2) of this section that is agreed upon at the pre-transfer conference.

(h) The pressure-sensing devices required by paragraphs (d) and (f) of this section must be located in the vapor collection line between the facility vapor connection and the following:

(1) Any isolation valve, unless an interlock is provided that prevents operation of the system when the isolation valve is closed; and

(2) Any components that could plug and cause a blockage in the vapor line.

(i) A pressure-indicating device must be provided that displays the pressure in the vapor collection line between the facility vapor connection and any isolation valve or any devices which could cause a blockage in the vapor line.

(j) If a facility draws vapor from the vessel with a vapor-moving device capable of drawing more than 1 pound per square inch (psi) vacuum, a vacuum relief valve must be installed in the vapor collection line between the vapor-moving device and the facility vapor connection, which—

(1) Relieves at a predetermined pressure such that the pressure at the facility vapor connection is maintained at or above 13.7 psia (−1 psig);

(2) Has a relieving capacity equal to or greater than the capacity of the vapor-moving device;

(3) Has a flame arrester or flame screen fitted at the vacuum relief opening; and

(4) Has been tested for relieving capacity in accordance with paragraph 1.5.1.3 of API 2000 (incorporated by reference, *see* 33 CFR 154.106) with a flame arrester or flame screen fitted.

(k) When a facility collects cargo vapor through an extensive length of vapor piping before reaching the first pressure sensor and vacuum relief valve, the vacuum relief valve may be set at a vacuum greater than 1 psi vacuum, provided the pressure controls take into account the pressure drop across the vessel's vapor collection system, any vapor collection hoses, and the vapor piping as a function of the actual transfer rate.

(l) If the pressure in the vapor collection system can exceed 1.5 psig during a malfunction of a pressure regulator or control valve in an inerting, enriching, or diluting system, a pressure relief valve must—

(1) Be located between where the inerting, enriching, or diluting gas is introduced into the vapor collection system and the facility vapor connection;

(2) Relieve at the higher of the following two pressures:

(i) A pressure such that the pressure at the facility vapor connection does not exceed 1.5 psig; or

(ii) The lowest pressure relief valve setting of vessels that control vapors at the facility;

(3) Have a relieving capacity equal to or greater than the maximum capacity of the facility inerting, enriching, or diluting gas source flowing through the failed pressure regulator or control valve, taking into account the pressure drops across any flame arrester or discharge piping fitted at the relief valve's discharge;

(4) Have a flame arrester or flame screen fitted at the discharge opening, if the design does not secure a minimum vapor discharge velocity of 30 meters (98.4 feet) per second; and

(5) Have been tested for relieving capacity in accordance with paragraph 1.5.1.3 of API 2000.

(m) The relieving capacity test required by paragraph (l)(5) of this section must be carried out with a flame screen fitted at the discharge opening if—

(1) The design of the pressure relief valve does not secure a minimum vapor discharge velocity of 30 meters (98.4 feet) per second; and

(2) The discharge is not fitted with a flame arrester.

(n) A facility that collects vapors emitted from vessel cargo tanks while inerting cargo tanks must—

(1) Provide a pressure-sensing device that activates an alarm meeting 33 CFR 154.2100(e) when the pressure of the inerting gas exceeds either the pressure corresponding to the higher pressure determined in paragraph (b) of this section or a lower pressure agreed upon at the pre-transfer conference;

(2) Provide a pressure-sensing device, independent of the device required by paragraph (n)(1) of this section, which automatically stops the flow of inerting, padding, or purging gas to the vessel when the pressure of the inerting gas exceeds 90 percent of the lowest setting of any pressure relief valve on the vessel; and

(3) Locate the pressure-sensing devices required by paragraphs (n)(1) and (n)(2) of this section in the inerting piping downstream of any devices that could potentially isolate the vessel from the sensing devices.

§ 154.2104 Cargo line clearance system.

If a line clearance (pigging) system is used to clear cargo in the cargo lines to the tank vessel while the vessel is connected to the facility vapor control system (VCS), the pigging system must be designed with the following safety features:

(a) A bypass loop installed in the main liquid cargo line that contains the pig-receiving device, through which all the liquid flow is channeled during pigging operations. The pig must act as a seal to separate the vessel from the compressed gas that is used to propel it as the pig travels from the pig launcher to the pig-receiving device;

(b) A mechanism for restricting liquid and gas flow so that the vessel, personnel, and environment are not endangered. The compressed gas flow capacity that this mechanism secures must not be more than 95 percent of the combined capacity of all vessel and facility VCS relief valves located upstream of the facility's remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a);

(c) An automatic shutoff valve, which closes on a high-pressure signal from the pressure sensor required by 33 CFR 154.2103(f), located in the liquid bypass loop downstream of the pig-receiving device;

(d) An interlock with the main cargo line manual block valve so that line-clearing operations cannot begin unless the main cargo line manual block valve is closed; and

(e) A means to detect arrival of the pig at the pig-receiving device.

§ 154.2105 Fire, explosion, and detonation protection.

This section applies only to facilities that control vapors of flammable, combustible, or non-high flash point liquid cargoes.

(a) A vapor control system (VCS) with a single facility vapor connection that receives inerted cargo vapor from a vessel and processes it with a vapor recovery unit must—

(1) Be capable of inerting the vapor collection line in accordance with 33 CFR 154.2107(a) before receiving the vessel's vapor and have at least one oxygen analyzer, which satisfies the requirements of 33 CFR 154.2107(f)(1), (f)(2), (g), (h)(2), and (h)(3), sampling the vapor concentration continuously at a point as close as practicable to the facility vapor connection. The total pipe length between the analyzer and the facility vapor connection must not exceed 6 meters (19.7 feet); or

(2) Have a detonation arrester located as close as practicable to the facility vapor connection. The total pipe length between the detonation arrester and the facility vapor connection must not exceed 18 meters (59.1 feet).

(b) A VCS with a single facility vapor connection that receives only inerted cargo vapor from a vessel and processes it with a vapor destruction unit must—

(1) Satisfy the requirements of paragraph (a)(1) of this section and have a detonation arrester located as close as practicable to the facility vapor connection. The total pipe length between the detonation arrester and the facility vapor connection must not exceed 18 meters (59.1 feet); or

(2) Have an inerting system that meets the requirements of 33 CFR 154.2107.

(c) A VCS with a single facility vapor connection that receives vapor from a vessel with cargo tanks that are not inerted or are partially inerted, and processes it with a vapor recovery unit must—

(1) Have a detonation arrester located as close as practicable to the facility vapor connection. The total pipe length between the detonation arrester and the facility vapor connection must not exceed 18 meters (59.1 feet); or

(2) Have an inerting, enriching, or diluting system that meets the requirements of 33 CFR 154.2107.

(d) A VCS with a single facility vapor connection that receives vapor from a vessel with cargo tanks that are not inerted or are partially inerted, and processes the vapor with a vapor destruction unit must—

(1) Have a detonation arrester located as close as practicable to the facility

vapor connection. The total pipe length between the detonation arrester and the facility vapor connection must not exceed 18 meters (59.1 feet); and

(2) Have an inerting, enriching, or diluting system that satisfies the requirements of 33 CFR 154.2107.

(e) A VCS with multiple facility vapor connections that receives vapor from vessels with cargo tanks that carry inerted, partially inerted, non-inerted, or combinations of inerted, partially inerted, and non-inerted cargoes, and processes them with a vapor recovery unit, must have a detonation arrester located as close as practicable to each facility vapor connection. The total pipe length between the detonation arrester and each facility vapor connection must not exceed 18 meters (59.1 feet).

(f) A VCS with multiple facility vapor connections that receives only inerted cargo vapor from vessels and processes it with a vapor destruction unit must—

(1) Satisfy the requirements of paragraph (a)(1) of this section for each facility vapor connection and have a detonation arrester located as close as practicable to each facility vapor connection. The total pipe length between the detonation arrester and each facility vapor connection must not exceed 18 meters (59.1 feet); or

(2) Have an inerting, enriching, or diluting system that meets the requirements of 33 CFR 154.2107.

(g) A VCS with multiple facility vapor connections that receives vapor from vessels with non-inerted or partially inerted cargoes, and processes the vapor with a vapor destruction unit must—

(1) Have a detonation arrester located as close as practicable to each facility vapor connection. The total pipe length between the detonation arrester and each facility vapor connection must not exceed 18 meters (59.1 feet); and

(2) Have an inerting, enriching, or diluting system that meets the requirements of 33 CFR 154.2107.

(h) A VCS with multiple facility vapor connections that simultaneously receives vapor from vessels with inerted, partially inerted, and non-inerted cargoes, and processes the vapor with a vapor destruction unit must—

(1) Have a detonation arrester located as close as practicable to each facility vapor connection. The total pipe length between the detonation arrester and each facility vapor connection must not exceed 18 meters (59.1 feet); and

(2) Have an inerting, enriching, or diluting system that meets the requirements of 33 CFR 154.2107; or

(3) Have a base loading system that meets the requirements of 33 CFR 154.2107(m).

(i) A VCS that uses a vapor balancing system in which cargo vapor from a vessel or facility storage tank is transferred through the facility vapor collection system to facility storage tanks or a vessel must meet the requirements of 33 CFR 154.2110.

(j) Each outlet of a VCS that vents to the atmosphere, except for a discharge vent from a vapor destruction unit or relief valve installed to comply with 33 CFR 154.2103(j) and (k) or 33 CFR 154.2203(e), (k), and (l), must—

(1) Have a detonation arrester located at the outlet; or

(2) Have a flame arrester if—

(i) The discharge vent stream's total flammable concentration is proven to be less than 50 percent of the lower flammable limit at all times by an outlet concentration analyzer for carbon beds, proof of correct operating temperature for refrigeration systems, or proof of scrubbing medium flow for scrubbers; and

(ii) The proving devices in paragraph (j)(2)(i) of this section close the remotely operated cargo vapor shutoff valve required in 33 CFR 154.2101(a) and shut down any vapor-moving device if operating outside the conditions necessary to maintain the discharge vent non-combustible.

§ 154.2106 Detonation arresters installation.

This section applies only to facilities collecting vapors of flammable, combustible, or non-high flash point liquid cargoes.

(a) Each detonation arrester required by this part must be installed with a minimum distance of 0.6 meters (2 feet) from the arrester flange face to any pipe bend, shutoff valve, or other device that restricts the flow area of the piping.

(b) Detonation arresters must be installed in accordance with the guidelines outlined in the arrester manufacturer's acceptance letter provided by the Coast Guard.

(c) Line size expansions in a straight pipe run must be no closer than 120 times the pipe's diameter from the detonation arrester unless the manufacturer has test data to show the expansion can be closer.

§ 154.2107 Inerting, enriching, and diluting systems.

This section applies only to facilities that control vapors of flammable, combustible, or non-high flash point liquid cargoes.

(a) Before receiving cargo vapor, a vapor control system (VCS) that uses a gas for inerting, enriching, or diluting must be capable of inerting, enriching, or diluting the vapor collection line, at a minimum of two-volume exchanges of inerting, enriching, or diluting gas, downstream of the injection point.

(b) A VCS that uses an inerting, enriching, or diluting system must be equipped, except as permitted by 33 CFR 154.2105(a), with a gas injection and mixing arrangement located as close as practicable to the facility vapor connection. The total pipe length between the arrangement and the facility vapor connection must not exceed 22 meters (72.2 feet). The arrangement must be such that it provides complete mixing of the gases within 20 pipe diameters of the injection point.

(c) A VCS that uses an inerting or enriching system may not be operated at a vacuum after the injection point unless—

(1) There are no vacuum relief valves or other devices that could allow air into the vapor collection system downstream of the injection point, and pipe connections are flanged, threaded, or welded so no air can leak into the VCS; or

(2) An additional analyzer is used to monitor the downstream vapor concentration and a mechanism is provided to inject additional inerting or enriching gas.

(d) A VCS that uses analyzers to control the amount of inerting, enriching, or diluting gas injected into the vapor collection line must be equipped with at least two analyzers. The analyzers must be connected so that—

(1) When two oxygen analyzers are used, the higher oxygen concentration reading controls the inerting or enriching system and activates the alarm and automatic shutdown system required by paragraph (h), (j), or (k)(2) of this section;

(2) When more than two oxygen analyzers are used, the majority pair controls the inerting or enriching system and activates the alarm and automatic shutdown system required by paragraph (h), (j), or (k)(2) of this section;

(3) When two hydrocarbon analyzers are used, the lower hydrocarbon concentration reading controls the enriching system and activates the alarm and automatic shutdown system required by paragraph (i) of this section;

(4) When more than two hydrocarbon analyzers are used, the majority pair controls the enriching system and activates the alarm and automatic shutdown system required by paragraph (i) of this section;

(5) When two hydrocarbon analyzers are used, the higher hydrocarbon concentration reading controls the diluting system and activates the alarm

and automatic shutdown system required by paragraph (l) of this section; and

(6) When more than two hydrocarbon analyzers are used, the majority pair controls the diluting system and activates the alarm and automatic shutdown system required by paragraph (l) of this section.

(e) A VCS that uses volumetric measurements to control the amount of inerting, enriching, or diluting gas injected into the vapor collection line must be equipped, except as permitted by paragraph (m) of this section, with at least one analyzer to activate the alarms and automatic shutdown systems required by this section.

(f) Each oxygen or hydrocarbon analyzer required by this section must—

(1) Be installed in accordance with API 550 (incorporated by reference, *see* 33 CFR 154.106);

(2) Have a system response time of not more than one minute from sample input to 95 percent of final stable value as tested per 33 CFR 154.2180 and 33 CFR 154.2181; and

(3) Continuously sample the vapor concentration not more than 30 pipe diameters from the gas injection point.

(g) A VCS must not use oxygen analyzers that operate at elevated temperatures (*i.e.,* zirconia oxide or thermomagnetic).

(h) An inerting system must—

(1) Supply sufficient inert gas to the vapor stream to ensure that the oxygen concentration downstream of the injection point is maintained at or below 60 percent by volume of the minimum oxygen concentration for combustion (MOCC) for the specific combination of cargo vapors and inert gas being processed, which may be determined by using Coast Guard guidance available at *http://homeport.uscg.mil;*

(2) Activate an alarm that satisfies the requirements of 33 CFR 154.2100(e) when the oxygen concentration in the vapor collection line exceeds 60 percent by volume of the MOCC for the specific combination of cargo vapors and inert gas being processed, which may be determined by using Coast Guard guidance available at *http://homeport.uscg.mil;*

(3) Close the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a) and shut down any vapor-moving device when the oxygen concentration in the vapor collection line exceeds 70 percent by volume of the MOCC for the specific combination of cargo vapors and inert gas being processed, which may be determined by using Coast Guard guidance available at *http://homeport.uscg.mil;*

(4) Have a detonation arrester and a mechanism to prevent the backflow of flammable vapors installed between the combustion device and the inert gas injection point, if a combustion device is used to produce the inert gas; and

(5) Have an alarm value in paragraph (h)(2) of this section that is at least one percentage point less than the shutdown value in paragraph (h)(3) of this section. If the analyzers used to measure oxygen concentrations cannot accurately differentiate between the alarm value and the shutoff value, the alarm value must be lowered until the analyzers become operable.

(i) An enriching system must—

(1) Supply sufficient compatible hydrocarbon vapor to the vapor stream to make sure that the total flammable concentration downstream of the injection point is maintained either at or above 170 percent by volume of the upper flammable limit or above the upper flammable limit plus 10 percentage points, whichever is lower;

(2) Activate an alarm that satisfies the requirements of 33 CFR 154.2100(e) when the total flammable concentration in the vapor collection line either falls below 170 percent by volume of the upper flammable limit or below the upper flammable limit plus 10 percentage points, whichever is lower;

(3) Close the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a) and shut down any vapor-moving device when the total flammable concentration in the vapor collection line either falls below 150 percent by volume of the upper flammable limit or below the upper flammable limit plus 7.5 percentage points, whichever is lower; and

(4) Have an upper flammable limit listed in paragraphs (i)(1), (i)(2), and (i)(3) of this section which is either the cargo's upper flammable limit or the enriching gas's upper flammable limit, whichever is higher. Alternatively, the mixture's upper flammable limit, which may be determined by using methods found in Coast Guard guidance available at *http://homeport.uscg.mil,* may be used.

(j) Oxygen analyzers may be used instead of hydrocarbon analyzers in a VCS using an enriching system that receives cargo vapor only from a vessel with non-inerted cargo tanks, providing that the analyzers—

(1) Activate an alarm satisfying the requirements of 33 CFR 154.2100(e) when the oxygen concentration in the vapor collection line exceeds a level corresponding to either a total flammable concentration of 170 percent by volume of the upper flammable limit or the upper flammable limit plus 10 percentage points, whichever yields a higher oxygen concentration;

(2) Close the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a) and shut down any vapor-moving device when the oxygen concentration in the vapor collection line exceeds a level corresponding to either a total flammable concentration of 150 percent by volume of the upper flammable limit or the upper flammable limit plus 7.5 percentage points, whichever yields a higher oxygen concentration;

(3) Have an alarm value in paragraph (j)(1) of this section that is at least one percentage point less than the shutdown value in paragraph (j)(2) of this section. If the oxygen analyzers used to measure oxygen concentrations cannot accurately differentiate between the alarm value and the shutdown value, the alarm value must be lowered until the analyzers become operable; and

(4) Have an upper flammable limit listed in paragraphs (j)(1) and (j)(2) of this section which is either the cargo's upper flammable limit or the enriching gas's upper flammable limit, whichever is higher. Alternatively, the mixture's upper flammable limit, which may be determined by using methods found in Coast Guard guidance available at *http://homeport.uscg.mil,* may be used.

(k) An enriching system may be used in a VCS that receives inerted cargo vapor from a vessel if—

(1) Hydrocarbon analyzers are used to comply with paragraphs (i)(2) and (i)(3) of this section; or

(2) Oxygen analyzers are used, in which case the analyzers must—

(i) Activate an alarm meeting 33 CFR 154.2100(e) when the oxygen concentration in the vapor collection line exceeds 60 percent by volume of the MOCC for the specific combination of cargo vapors and gases; and

(ii) Close the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a) and shut down any vapor-moving device when the oxygen concentration exceeds 70 percent by volume of the MOCC for the specific combination of cargo vapors and gases; and

(3) The MOCC in paragraphs (k)(2)(i) and (k)(2)(ii) of this section is either the cargo's MOCC or the enriching gas's MOCC, whichever is lower. Alternatively, the mixture's MOCC, which may be determined using Coast Guard guidance available at *http://homeport.uscg.mil,* may be used.

(l) An air dilution system must—

(1) Supply a sufficient amount of additional air to the vapor stream to keep the total flammable concentration downstream of the injection point below

30 percent by volume of the lower flammable limit;

(2) Activate an alarm that satisfies the requirements of 33 CFR 154.2100(e) when the total flammable concentration in the vapor collection line exceeds 30 percent by volume of the lower flammable limit; and

(3) Close the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2100(a) and shut down any vapor-moving device when the total flammable concentration in the vapor collection line exceeds 50 percent by volume of the lower flammable limit.

(m) An enriching system may use a base loading method to control the amount of enriching gas in a vapor collection system if—

(1) The flow rate of enriching gas is determined by assuming the vapor entering the facility vapor connection consists of 100 percent air;

(2) Two independent devices are used to verify the correct enriching gas volumetric flow rate. One of the two devices must be a flow meter;

(3) One of the devices activates an alarm that satisfies the requirements of 33 CFR 154.2100(e) when the amount of enriching gas added results in a total flammable concentration in the vapor collection line either below 170 percent by volume of the upper flammable limit or below the upper flammable limit plus 10 percentage points, whichever is lower;

(4) The second device activates closure of the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a) and shuts down any vapor-moving device when the amount of enriching gas added results in a total flammable concentration in the vapor collection line either below 150 percent by volume of the upper flammable limit or below the upper flammable limit plus 7.5 percentage points, whichever is lower; and

(5) The upper flammable limit in paragraphs (m)(3) and (m)(4) of this section is either the cargo's upper flammable limit or the enriching gas's upper flammable limit, whichever is higher. Alternatively, the mixture's upper flammable limit, which may be determined using Coast Guard guidance available at *http://homeport.uscg.mil,* may be used.

(n) For controlling vapors of different cargoes at multiple berths while using enriching gas, the highest upper flammable limit or the lowest MOCC of the cargo or enriching gas, whichever is applicable, is used to determine the analyzer alarm and shutdown setpoints. Alternatively, the mixture's upper flammable limit or MOCC, which may be determined by using Coast Guard guidance available at *http://homeport.uscg.mil,* may be used.

(o) For controlling vapors of inert and non-inert cargoes at multiple berths while using enriching gas—

(1) The lowest MOCC of the cargo or enriching gas is used to determine the analyzer alarm and shutdown setpoints at all berths. Alternatively, the mixture's MOCC, which may be determined using Coast Guard guidance available at *http://homeport.uscg.mil,* may be used; or

(2) A base loading method meeting the requirements of paragraph (m) of this section is used for all berths.

§ 154.2108 Vapor-moving devices.

(a) Paragraphs (b) and (e) of this section apply only to facilities collecting vapors of flammable, combustible, or non-high flash point liquid cargoes.

(b) Each inlet and outlet to a vapor-moving device that handles vapor that has not been inerted, enriched, or diluted in accordance with 33 CFR 154.2107 must be fitted with a detonation arrester; however, the outlet detonation arrester may be omitted if the vapor-moving device is within 50 times the pipe's diameter of the detonation arrester required by 33 CFR 154.2109(a).

(c) If the vapor is handled by a reciprocating or screw-type compressor in the vapor collection system, the compressor must be installed with indicators and audible and visible alarms to warn against the following conditions:

(1) Excessive gas temperature at the compressor outlet;

(2) Excessive cooling water temperature;

(3) Excessive vibration;

(4) Low lube oil level;

(5) Low lube oil pressure; and

(6) Excessive shaft bearing temperature.

(d) If the vapor is handled by a liquid ring-type compressor in the vapor collection system, it must be installed with indicators and audible and visible alarms to warn against the following conditions:

(1) Low level of liquid sealing medium;

(2) Lack of flow of the liquid sealing medium;

(3) Excessive temperature of the liquid sealing medium;

(4) Low lube oil level;

(5) Low lube oil pressure, if pressurized lubricating system; and

(6) Excessive shaft bearing temperature.

(e) If the vapor is handled by a centrifugal compressor, fan, or lobe blower in the vapor collection system, construction of the blades or housing must be one of the following:

(1) Blades or housing of nonmetallic construction;

(2) Blades and housing of nonferrous material;

(3) Blades and housing of corrosion resistant steel;

(4) Ferrous blades and housing with one-half inch or more design tip clearance;

(5) Nonferrous blades and ferrous housing with one-half inch or more design tip clearance; or

(6) Blades of aluminum or magnesium alloy and a ferrous housing with a nonferrous insert sleeve at the periphery of the impeller.

§ 154.2109 Vapor recovery and vapor destruction units.

Paragraphs (a), (b), and (e) of this section apply only to facilities collecting vapors of flammable, combustible, or non-high flash point liquid cargoes.

(a) The inlet to a vapor recovery unit that receives vapor that has not been inerted, enriched, or diluted in accordance with 33 CFR 154.2107 must be fitted with a detonation arrester.

(b) The inlet to a vapor destruction unit must—

(1) Have a liquid seal that meets the requirements of paragraph (e) of this section, except as specified by paragraph (b)(3) of this section; and

(2) Have two quick-closing stop valves installed in the vapor line. One of them must be installed upstream of the detonation arrester required by paragraph (c)(2) of this section. The quick-closing stop valves must—

(i) Close within 30 seconds after detection of a shutdown condition by a control component required by this subpart for a vapor control system (VCS) with a vapor destruction unit;

(ii) Close automatically if the control signal is lost;

(iii) Have a local valve position indicator or be designed so that the valve position is readily determined from the valve handle or valve stem position; and

(iv) If the valve seat is fitted with resilient material, not allow appreciable leakage when the resilient material is damaged or destroyed; and

(3) Instead of a liquid seal as required by paragraph (b)(1) of this section, have the following:

(i) An anti-flashback burner approved by the Commandant and installed at each burner within the vapor destruction unit; and

(ii) A differential pressure sensor that activates the quick-closing stop valves as required by paragraph (b)(2) of this section upon sensing a reverse flow condition.

(c) A vapor destruction unit must—

(1) Not be within 30 meters (98.8 feet) of any tank vessel berth or mooring at the facility;

(2) Have a detonation arrester fitted in the inlet vapor line; and

(3) Activate an alarm that satisfies the requirements of 33 CFR 154.2100(e) and shut down when a flame is detected on the detonation arrester.

(d) When a vapor destruction unit shuts down or has a flame-out condition, the vapor destruction unit control system must—

(1) Activate and close the quick-closing stop valves required by paragraph (b)(2) of this section;

(2) Close the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a); and

(3) Automatically shut down any vapor-moving devices installed in the VCS.

(e) If a liquid seal is installed at the inlet to a vapor destruction unit, then—

(1) The liquid used in the liquid seal must be compatible with the vapors being controlled;

(2) For partially or totally soluble cargoes that can polymerize in solution, there must be an adequate amount of inhibitor in the liquid seal;

(3) The liquid seal must be compatible with the design of the VCS and must not contribute to the flammability of the vapor stream; and

(4) The liquid seal must have a low-level alarm and a low-low level shutdown.

§ 154.2110 Vapor balancing requirements.

Paragraphs (a)(2), (a)(4), (b), and (c) of this section apply only to facilities transferring vapors of flammable, combustible, or non-high flash point liquid cargoes.

(a) A vapor control system (VCS) that uses a vapor balancing system in which cargo vapor is transferred from a vessel cargo tank or facility storage tank through the facility vapor collection system to a facility storage tank or vessel cargo tank must—

(1) Have facility storage tank high-level alarm systems and facility storage tank overfill control systems arranged to prevent the cargo from entering the vapor return line;

(2) Have a detonation arrester located within the storage tank containment area and a detonation arrester located as close as practicable to the facility vapor connection. The total pipe length between the detonation arrester and the facility vapor connection must not exceed 18 meters (59.1 feet);

(3) Meet the overpressure and over-vacuum protection requirements of 33 CFR 154.2103; and

(4) For inert cargo systems, have at least one oxygen analyzer in the vapor line that activates an alarm that satisfies the requirements of 33 CFR 154.2100(e) when the oxygen concentration in the vapor line exceeds 60 percent by volume of the minimum oxygen concentration for combustion (MOCC) for the specific combination of cargo vapor and inert gas, which may be determined using Coast Guard guidance available at *http://homeport.uscg.mil.*

(b) A vapor balancing system, while in operation to transfer vapor to or from a vessel cargo tank and connected by way of the facility storage tank vent to a facility's main VCS with a vapor destruction unit, must have—

(1) A mechanism to prevent backflow of vapor from the facility's main VCS to the marine vapor line; and

(2) Two fail-safe, quick-closing valves installed in the marine vapor line at the facility storage tank that automatically close when—

(i) Flame is detected on the facility storage tank; or

(ii) The temperature of the facility storage tank's vapor space reaches 177 °C (350 °F) or 70 percent of the vapor's auto-ignition temperature in degrees Celsius, whichever is lower.

(c) Transferring vapor from a non-inerted facility storage tank to a vessel cargo tank that is required to be inerted in accordance with 46 CFR 32.53, 153.500, or Table 151.05, is prohibited.

(d) A vapor balancing system that transfers vapor to a vessel cargo tank must not use a vapor-moving device to assist vapor transfer or inject inerting, enriching, or diluting gas into the vapor line without approval from the Commandant.

§ 154.2111 Vapor control system connected to a facility's main vapor control system.

(a) When a marine vapor control system (VCS) is connected to a facility's main VCS serving other plant processing areas that are not related to tank vessel operations, the marine vapor line, before the point where the marine VCS connects to the facility's main VCS, must be fitted with—

(1) A detonation arrester, unless both the marine VCS and the facility's main VCS only control vapors of cargoes that are non-flammable, non-combustible, or that have high flashpoints;

(2) Two fail-safe, quick closing valves, one on each side of any detonation arrester required by paragraph (a)(1) of this section, which automatically close when a flame is detected on the detonation arrester or a VCS shutdown condition occurs, or when the facility's marine VCS is not in operation; and

(3) A mechanism to prevent backflow of vapors to the marine vapor line.

(b) Vapors from plant processing areas unrelated to tank vessel operations must not enter the vapor line of a marine VCS before the devices required by paragraph (a) of this section.

(c) A facility that wants to connect a facility vapor line, which collects vapor from other plant processing areas that are not related to tank vessel operations, to a marine VCS, must receive approval in writing from the Commandant.

§ 154.2112 Vapors with potential to polymerize or freeze—Special requirements.

(a) A vapor control system (VCS) that controls vapors with the potential to polymerize at a normal ambient condition must—

(1) Be designed to prevent condensation of monomer vapor. Methods such as heat tracing and insulation are permitted if they do not result in an increased risk of polymerization;

(2) Be designed so that polymerization can be detected. Any points suspected of being sites for potential polymerization buildup must be equipped with inspection openings; and

(3) Include devices to measure the pressure drop across detonation arresters due to polymerization. Any device used for this purpose, including differential pressure monitors, must not have the capability of transmitting a detonation across the detonation arrester.

(b) A VCS that controls cargo vapors that potentially freeze at ambient temperature must have a design that prevents the freezing of vapors or condensate at ambient temperature or that detects and removes the liquid condensate and solids to prevent accumulation.

§ 154.2113 Alkylene oxides—Special requirements.

A vapor control system (VCS) that controls vapors of an alkylene oxide must comply with the following:

(a) The VCS's equipment, hoses, piping, and all piping components, including valves, flanges, and fittings, which must be of a type and constructed out of materials suitable for use with alkylene oxide;

(b) The VCS used for collecting an alkylene oxide vapor must not be used for collecting other vapors and must be separated from any other VCS, except as specified by paragraph (c) of this section; and

(c) The VCS must be adequately cleaned in accordance with 33 CFR 154.2150(p) and recertified by a certifying entity if—

(1) The VCS is used to control other vapors; or

(2) The VCS is returned to alkylene oxide service after being used to control other cargo vapors.

Transfer Facilities—Operations

§ 154.2150 General requirements.

(a) No transfer operation using a vapor control system (VCS) may be conducted unless the facility operator has a copy of the facility operations manual, with the VCS addendum, marked by the local Coast Guard Captain of the Port (COTP) as required by 33 CFR 154.325(d).

(b) Personnel in charge of a facility must ensure that—

(1) The facility controls vapor only from cargoes that are properly authorized for vapor control in the facility's certification letter;

(2) The facility transfers vapor only to or from a vessel that has its certificate of inspection or certificate of compliance endorsed in accordance with 46 CFR 39.1013 or 46 CFR 39.1015 for each cargo intended for transfer; and

(3) If the vessel tanks to be vapor controlled contain vapor from previous cargo transfers other than the cargo or cargoes intended for transfer, the facility and vessel must be authorized to control the additional vapor from the previous cargo transfers. Any oxygen or hydrocarbon analyzer alarm and shutdown setpoints must be set to accommodate all of the cargo vapors.

(c) The facility personnel in charge must ensure that safety system testing is conducted as follows:

(1) Pressure sensors, alarms, and automatic shutdown systems required by 33 CFR 154.2103, 154.2107, and 154.2110, except as exempted by paragraph (c)(2) or (c)(3) of this section, must be tested by applying the test pressure at the sensors not more than 24 hours before each transfer;

(2) The pressure sensors required by 33 CFR 154.2103 may meet the requirements of the test program contained in 33 CFR 154.2180 and 33 CFR 154.2181 instead of the current program, which mandates tests within 24 hours before each transfer as required by paragraph (c)(1) of this section;

(3) Visible and audible alarm indicators must be tested not more than 24 hours before each transfer;

(4) The analyzers required by 33 CFR 154.2105, 154.2107, and 154.2110, except as exempted by paragraph (c)(5) of this section, must be checked for calibration response by using a span gas not more than 24 hours before each transfer;

(5) The analyzers required by 33 CFR 154.2105, 154.2107, and 154.2110 may be checked for calibration response by use of a span gas as defined by the test program contained in 33 CFR 154.2180 and 33 CFR 154.2181, and comply with the minimum requirements as defined in 33 CFR 154.2180 and 33 CFR 154.2181, instead of the test required by paragraph (c)(4) of this section; and

(6) The vacuum and pressure relief valves required by 33 CFR 154.2103 must be checked not more than 24 hours before each transfer to make sure they are operating without constraint and to ensure that any required flame screens or flame arresters are not damaged.

(d) The proper position of all valves in the vapor line between the vessel's tanks and the facility vapor collection system must be verified before the start of the transfer operation.

(e) A tank barge overfill control system that meets the requirements of 46 CFR 39.2009(a)(2) must—

(1) Not be connected to an overfill sensor circuit that exceeds the system's rated inductance and capacitance; and

(2) Be tested for proper operation after connection is made with the vessel by simulating liquid high level and overfill at each tank.

(f) When receiving vapor from a vessel with cargo tanks that are required to be inerted in accordance with 46 CFR 32.53, 46 CFR 153.500, or 46 CFR Table 151.05, the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a) must not be opened until the pressure at the facility vapor connection exceeds 0.2 pounds per square inch gauge (psig).

(g) The initial cargo transfer rate must not exceed the rate agreed upon at the pre-transfer conference and 46 CFR 39.3001(g).

(h) The cargo transfer rate must not exceed the maximum allowable transfer rate as determined by the lesser of the following:

(1) A transfer rate corresponding to the maximum vapor processing rate for the VCS, as specified in the facility operations manual; or

(2) The vessel's maximum transfer rate in accordance with 46 CFR 39.3001(d).

(i) While transferring cargo to a vessel connected to a VCS, compressed air or gas may be used to clear cargo hoses and loading arms, but must not be used to clear cargo lines unless a cargo line clearance (pigging) system that meets 33 CFR 154.2104 is provided.

(j) If a pigging system is used to clear cargo lines to the tank vessel while the vessel is connected to the facility VCS, the following operational requirements apply:

(1) The VCS must be in operation, with all of the high-pressure alarms and shutdowns required by 33 CFR 154.2103 active, before and during line-clearing operations;

(2) Personnel performing the line-clearing operation must be adequately trained on the specific line-clearing system being used. Accurate written procedures that address event sequence, equipment, safety precautions, and overpressurization hazards must be made available to all personnel involved in the line-clearing operations;

(3) Line-clearing procedures must be reviewed by both the vessel and facility personnel in charge as part of the pre-transfer conference. Topics of discussion during the pre-transfer conference must include, but need not be limited to—

(i) Event sequence;

(ii) Equipment;

(iii) Safety precautions;

(iv) Overpressurization hazards;

(v) Personnel roles;

(vi) Gas volumetric flow rates;

(vii) Gas pressures;

(viii) Volume of residual cargo in the line;

(ix) Amount of ullage space that is available for line displacement and connections;

(x) Valve alignment;

(xi) Units of measure;

(xii) Terminology; and

(xiii) Anticipated duration of the evolution;

(4) The pig must be inspected to ensure that it is of sufficient durability and condition; be of an appropriate size, type, and construction for the intended operation; and be inspected for defects before each use and replaced if necessary;

(5) Personnel performing line-clearing operations must monitor pig movement at all times. The facility and vessel manifold valves must be closed immediately after the pig reaches the pig-receiving device; and

(6) If the pigging system contains pressure-sensing, relieving, or alarming components in addition to those required by 33 CFR 154.2103, the components must be periodically tested in accordance with paragraphs (c) and (q) of this section.

(k) If one or more analyzers required by 33 CFR 154.2107 and 154.2110 become inoperable during a transfer operation, the operation may continue, provided that at least one analyzer remains operational; however, no further transfer operations may start until all inoperable analyzers are replaced or repaired.

(l) Whenever a condition results in a shutdown of the VCS, the emergency shutdown system required by 33 CFR 154.550 must be automatically activated

to terminate cargo loading into tanks which are being vapor controlled.

(m) If it is suspected that a flare in the VCS has had a flashback, or if a flame is detected on a detonation arrester required by 33 CFR 154.2109(c)(2), the transfer operation must stop and cannot restart until that detonation arrester and any quick-closing stop valves downstream of the detonation arrester are inspected and found to be in satisfactory condition.

(n) Before each transfer operation, the freezing point of each cargo must be determined. If there is a possibility that the ambient air temperature during transfer operations will be at or below the freezing point of the cargo, adequate precautions must be taken to prevent freezing of vapor or condensate, or to detect and remove the frozen liquid and condensation to prevent accumulation.

(o) Before each transfer operation, the cargo vapor must be evaluated to determine its potential to polymerize, and adequate precautions must be taken to prevent and detect polymerization of the cargo vapors.

(p) Mixing of incompatible vapors is prohibited. The VCS piping, equipment, hoses, valves, and arresters must be purged between vapor control operations that involve incompatible chemical vapors in accordance with the following:

(1) Chemical compatibility must be determined by using the procedures contained in 46 CFR part 150;

(2) Purge gas must be an inert gas, air, or enriching gas, and must be adequate to reduce the level of residual vapor to a level at which reaction with the subsequent vapor cannot occur; and

(3) The required duration of purge time must be calculated and approved by the certifying entity during the certification or recertification.

(q) VCS equipment and instrumentation must be tested as required by 33 CFR 156.170(g), with a representative of the COTP invited to witness these tests. The test procedure and a checklist must be approved by the certifying entity during the initial certification of the system and incorporated into the facility operations manual.

(r) A transfer operation that includes collection of vapor emitted to or from a vessel's cargo tanks must meet the transfer requirements of 33 CFR 156.120(aa), and a declaration of inspection meeting the requirements of 33 CFR 156.150 must be completed before each transfer.

Alternative Analyzer and Pressure Sensor Reliability Testing

§ 154.2180 Alternative testing program—Generally.

(a) As an alternative to complying with the vapor control system (VCS) analyzer and pressure sensor safety testing requirements provided by 33 CFR 154.2150(c) and 33 CFR 154.2250(c), the facility person in charge may administer a reliability assurance test program in accordance with this section and 33 CFR 154.2181.

(b) As used in this section:

(1) Calibration drift or *CD* means the difference in the analyzer output readings from the established reference value after a stated period of operation during which no unscheduled maintenance, repair, or adjustment took place;

(2) Calibration error or *CE* means the difference between the gas concentration exhibited by the gas analyzer and the known concentration of the cylinder gas;

(3) Response time or *RT* means the time interval between the start of a step change in the system input (*e.g.,* change of calibration gas) and the time when the data recording system displays 95 percent of the final stable value; and

(4) Sampling system bias or *SSB* means the difference between the gas concentrations indicated by the measurement system when a known cylinder gas is introduced at the outlet of the sampling probe and when the same gas is introduced directly to the analyzer.

(c) All analyzers used in a VCS must be safety system function tested and tested for CE, CD, RT, and SSB, in accordance with 33 CFR 154.2181.

(d) All pressure sensors/switches used in a VCS must be safety system function tested and tested for CE and CD, in accordance with 33 CFR 154.2181.

(e) The facility person in charge must ensure the following:

(1) Calibration of instrumentation using standard procedures provided by the manufacturer or service provider;

(2) Monitoring of all interlocks, alarms, and recording devices for proper operation while instrumentation is being calibrated;

(3) Use of a certified 2 percent or better gas standard to calibrate the analyzers; and

(4) Use of a certified secondary standard to calibrate the pressure sensors/switches.

(f) Upon failing any test under 33 CFR 154.2181, the facility person in charge must ensure that all monthly and quarterly tests, including CE, CD, RT, and SSB, are conducted; and until all quarterly tests are completed, the person in charge must ensure that the vapor control alarms and automatic shutdown system are tested no more than 24 hours prior to any transfer or tank barge cleaning operation.

(g) Analyzers required by 33 CFR 154.2105(a) and (j) and 154.2107(d) and (e) must be checked for calibration using a span gas.

(h) The facility operator must maintain and make available upon the request of the Commandant and the certifying entity that certifies the VCS the following reliability assurance test program documents for two years:

(1) All test procedures;

(2) The dates of all tests, type of tests made, and who conducted the tests;

(3) Results of the tests, including the "as found" and "as left" conditions; and

(4) A record of the date and time of repairs made.

§ 154.2181 Alternative testing program—Test requirements.

(a) The safety system function test required by 33 CFR 154.2180 must be performed once every two weeks and test for the proper operation and interaction of the analyzer or pressure sensor/switch with shutdown interlocks, and audible and visible alarm devices.

(b) The calibration error (CE) test required by 33 CFR 154.2180 must be performed once every month and documented as shown in Forms 154.2181(b)(2) and 154.2181(b)(3) of this section, to document the accuracy and linearity of the monitoring equipment for the entire measurement range.

(1) The CE test must expose the measurement system, including all monitoring components (*e.g.,* sample lines, filters, scrubbers, conditioners, and as much of the probe as practicable), to the calibration gases, introduced through an injection port located so as to allow a check of the entire measurement system when calibration gases are introduced;

(2) The CE test must check the calibrated range of each analyzer using a lower (zero) and upper (span) reference gas standard. Three measurements must be taken against each standard and recorded as shown in Form 154.2181(b)(2) of this section, with the average of the three values in each case then used to calculate the CE according to this equation (where CE = percentage calibration error based upon span of the instrument, R = reference value of zero or high-level calibration gas introduced into the monitoring system, A = actual monitoring system response to the calibration gas, and S = span of the instrument):

$$CE = \frac{|R - A|}{S} \times 100$$

FORM 154.2181(b)(2)—CALIBRATION ERROR DETERMINATION

	Calibration Value	Monitor Response	Difference	
			Zero	Span
1—Zero				
1—Span				
2—Zero				
2—Span				
3—Zero				
3—Span				
Mean Difference =				
Calibration Error =			%	%

(3) The CE test must check each pressure sensor/switch for upscale (activate) and downscale (deactivate) hysteresis around the sensor/switch set pressure. The calibration error must be calculated and recorded as shown in Form 154.2181(b)(3) of this section. Test the pressure sensor/switch three times and record the desired setting and the as-found set pressure. Calculate and record the difference of the two settings. Calculate the error percentage using this equation (where CE = percentage calibration error based upon span of the instrument, R = reference setting of the instrument, A = actual response as recorded on the test instrument, and S = span of the instrument):

$$CE = \frac{|R - A|}{S} \times 100$$

Record sensor "as-left" setting only if an adjustment is made.

FORM 154.2181(b)(3)—SWITCH CALIBRATION ERROR

QUALITY ASSURANCE DATA SHEET
SWITCH DATA RECORD

DATE. _____ F.I. NO. _____
_____

MANUFACTURER _____

MODEL NO._____ SERIAL NO. _____

SERVICE _____
_____

CR = CLOSES ON RISE OR = OPENS ON RISE
CF = CLOSES ON FALL OF = OPENS ON FALL

TEST EQUIPMENT	MODEL NO.	SERIAL NO.

FUNCTION	DESIRED	AS FOUND	DIFFERENCE	ERROR %	AS LEFT
Test #1 Set					
Reset					
Test #2 Set					
Reset					
Test #3 Set					
Reset					

SPEC NO. _____ TEST PERFORMED BY: _____

DATE: _____ ACCEPTED BY: _____

REMARKS:
_____
_____
_____

(c) The calibration drift (CD) test required by 33 CFR 154.2180 must be performed once every quarter and documented as shown in Form 154.2181(c)(3) of this section, to verify the ability of the instrument to conform to the established calibration.

(1) The CD measurement must be conducted once daily for seven consecutive days without making any adjustments to the instruments.

(2) Conduct the CD test at zero level (between 0 and 20 percent of the instrument span) and at high level (between 75 and 95 percent of the instrument span).

(3) Calculate and record the CD for seven consecutive days using the equations in paragraphs (b)(2) and (b)(3) of this section and Form 154.2181(c)(3) of this section.

FORM 154.2181(c)(3)—CALIBRATION DRIFT DETERMINATION

Day	Day/Time	Reference Value (RV)	Monitor Value	Difference (Error)	Percent of RV (Drift)
Low-Level:					

FORM 154.2181(c)(3)—CALIBRATION DRIFT DETERMINATION—Continued

Day	Day/Time	Reference Value (RV)	Monitor Value	Difference (Error)	Percent of RV (Drift)
High-Level:					

(d) The response time (RT) test required by 33 CFR 154.2180 must be performed once every quarter and documented as shown in Form 154.2181(d) of this section, to determine the RT which is the largest average response time in the upscale or downscale direction.

(1) For systems that normally operate below 20 percent of calibrated range, only a span (upscale) test is required.

(2) Record the span (upscale) value, zero (downscale) cylinder gas value, and stable, initial process-measured variable value.

(3) Determine the step change, which is equal to the average difference between the initial process-measured variable value and the average final stable cylinder gas-measured value.

(4) To determine both upscale and downscale step change intervals—

(i) Inject span (or zero) cylinder gas into the sample system as close to the sample probe as possible;

(ii) Allow the analyzer to stabilize and record the stabilized value. A stable reading is achieved when the concentration reading deviates less than 6 percent from the measured average concentration in 6 minutes or if it deviates less than 2 percent of the monitor's span value in 1 minute;

(iii) Stop the span (or zero) gas flow, allow the monitor to stabilize back to the measured variable value, and record the stabilized value; and

(iv) Repeat this procedure a total of three times and subtract the average final monitor reading from the average starting monitor value to determine the average upscale (or downscale) step change.

(5) Determine the response time, which is equal to the elapsed time at which 95 percent of the step change occurred.

(i) To find this value, take 5 percent of the average step change value and subtract the result from the cylinder gas analyzed value as shown in the following equation:

$$95\%\ \text{step change value} = \text{cylinder gas value} - (0.05 \times \text{avg. step change})$$

(ii) Inject span (or zero) cylinder gas into the sample system as close to the sample probe as possible, and measure the time it takes to reach the 95 percent step change value.

(iii) Repeat the previous step (paragraph (d)(5)(ii) of this section) a total of three times each with span and zero cylinder gas to determine average upscale and downscale response times.

(iv) Compare the response times achieved for the upscale and downscale tests. The longer of these two times equals the response time for the analyzer.

FORM 154.2181(d)—RESPONSE TIME

```
   Date of test _____
   Component/system ID#: _____
   Analyzer type _____
   Serial Number _____
   High-level gas concentration: ___ ppm / %
   Zero-level gas concentration: ___ ppm / %
   Analyzer span setting: ___ ppm / %
   Upscale:
   Stable starting monitor value: ____, ____, ____;
Avg. ____ ppm / %
   Stable ending monitor reading: ____, ____, ____;
Avg. ____ ppm / %
Step change interval: ____ ppm; 95%
Step change value: ____ ppm / %
   Elapsed time: ___, ____, ____; Avg. _____ seconds
   Downscale:
   Stable starting monitor value: ____, ____, ____;
Avg. ____ ppm / %
   Stable ending monitor reading: ____, ____, ____;
Avg. ____ ppm / %
Step change interval: ____ ppm; 95%
Step change value: ____ ppm / %
   Elapsed time: ____, ____, ____;
Avg. ____ seconds

   System response time = ___ seconds
```

(e) The sample system bias (SSB) test required by 33 CFR 154.2180 must be performed once every quarter and documented, to establish that the system has no additional influence on the measurement being made by the analyzer.

(1) Conduct a close CE test in accordance with paragraph (b) of this section, by injecting calibration gas as close as possible to the analyzer, eliminating as much of the sample system components as possible, while still simulating the normal source operating conditions.

(2) If system integrity is maintained, and it has not become contaminated, the difference between the close and standard CE tests should be the same.

(f) For CE and CD tests, analyzers and pressure sensors must meet the following minimum compliance requirements:

(1) Oxygen analyzers must not deviate from the reference value of the zero- or high-level calibration gas by more than 0.5 percent of full scale;

(2) Total hydrocarbon analyzers must not deviate from the reference value of the zero- or high-level calibration gas by more than 1 percent of full scale; and

(3) Pressure sensors/switches must not deviate from the reference value of the zero- or high-level calibration gas by more than 1.5 percent of full range.

(g) For RT tests, each oxygen or hydrocarbon analyzer must respond, in less than 1 minute, to 95 percent of the final stable value of a test span gas.

(h) For SSB tests, the analyzer system bias must be less than 5 percent of the average difference between the standard CE test and the close CE test, divided by the individual analyzer span.

Tank Barge Cleaning Facilities—VCS Design and Installation

§ 154.2200 Applicable transfer facility design and installation requirements.

A tank barge cleaning facility's (TBCF's) vapor control system (VCS) must meet the following design and installation requirements of this subpart for a transfer facility's VCS:

(a) 33 CFR 154.2100(b), (c), (f), (g), (i), (j), and (k): general design and installation requirements;

(b) 33 CFR 154.2106: detonation arrester installation;

(c) 33 CFR 154.2107: inerting, enriching, and diluting systems;

(d) 33 CFR 154.2108: vapor-moving devices;

(e) 33 CFR 154.2109: vapor recovery and vapor destruction units;

(f) 33 CFR 154.2111: VCS connected to a facility's main VCS;

(g) 33 CFR 154.2112: special requirements for vapors with the potential to polymerize or freeze; and

(h) 33 CFR 154.2113: special requirements for alkylene oxides.

§ 154.2201 Vapor control system—General requirements.

(a) Vapor control system (VCS) design and installation must eliminate potential overpressure and vacuum hazards, sources of ignition, and mechanical damage to the maximum practicable extent. Each remaining hazard source that is not eliminated must be specifically addressed in the protection system design and system operational requirements.

(b) Any pressure, flow, or concentration indication required by this part must provide a remote indicator on the facility where the VCS is controlled, unless the local indicator is clearly visible and readable from the operator's normal position at the VCS control station.

(c) Any condition requiring an alarm as specified in this part must activate an audible and visible alarm where the VCS is controlled.

(d) A mechanism must be developed and used to eliminate any liquid from the VCS.

(e) A liquid knockout vessel must be installed between the facility vapor connection and any vapor-moving device in systems that have the potential for two-phase (vapor/liquid) flow from the barge or the potential for liquid condensate to form as a result of the enrichment process. The liquid knockout vessel must have—

(1) A means to indicate the level of liquid in the device;

(2) A high liquid level sensor that activates an alarm that satisfies the requirements of 33 CFR 154.2100(e); and

(3) A high-high liquid level sensor that closes the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a) and shuts down any vapor-moving device before liquid is carried over to the vapor-moving device. One sensor with two stages may be used to meet this requirement as well as paragraph (e)(2) of this section.

§ 154.2202 Vapor line connections.

(a) 33 CFR 154.2101(a), (e), and (g) apply to a tank barge cleaning facility's (TBCF's) vapor control system (VCS).

(b) The remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a) must be located upstream of the liquid knockout vessel required by 33 CFR 154.2201(e).

(c) A fluid displacement system must have a remotely operated shutoff valve installed in the fluid injection supply line between the point where the inert gas or other medium is generated and the fluid injection connection. The valve must comply with 33 CFR 154.2101(a)(1) through (a)(6).

(d) Each hose used for transferring vapors must—

(1) Have a design burst pressure of at least 25 pounds per square inch gauge (psig);

(2) Have a maximum allowable working pressure (MAWP) no less than 5 psig;

(3) Be capable of withstanding at least the maximum vacuum rating of the vapor-moving device without collapsing or constricting;

(4) Be electrically continuous, with a maximum resistance of 10,000 ohms;

(5) Have flanges with a bolthole arrangement complying with the requirements for Class 150 ANSI B16.5 flanges (incorporated by reference, *see* 33 CFR 154.106);

(6) Be abrasion and kinking resistant; and

(7) Be compatible with vapors being transferred.

(e) Fixed vapor collection arms must meet the requirements of paragraph (d) of this section.

§ 154.2203 Facility requirements for barge vapor overpressure and vacuum protection.

In this section, the requirements of having a flame arrester or a flame screen at the opening of a pressure relief valve or a vacuum relief valve apply only to facilities collecting vapors of flammable, combustible, or non-high flash point liquid cargoes.

(a) A facility vapor collection system must have a capacity for collecting cleaning facility vapors at a rate of no less than 1.1 times the facility's maximum allowable gas-freeing rate, plus any inerting, diluting, or enriching gas that may be added to the system.

(b) A facility vapor control system (VCS) must be designed to prevent the pressure in a vessel's cargo tanks from going below 80 percent of the highest setting of any of the barge's vacuum relief valves or exceeding 80 percent of the lowest setting of any of the barge's pressure relief valves. The VCS must be capable of maintaining the pressure in the barge's cargo tanks within this range at any gas-freeing rate less than or equal to the maximum gas-freeing rate determined by the requirements in 46 CFR 39.6007(c).

(c) A fluid displacement system must provide a pressure-sensing device that activates an alarm that satisfies the requirements of 33 CFR 154.2100(e) when the pressure at the fluid injection connection exceeds either the pressure corresponding to the upper pressure determined in paragraph (b) of this section or a lower pressure agreed upon by the facility and barge persons in charge. The pressure-sensing device must be located in the fluid displacement system's piping downstream of any devices that could potentially isolate the barge's vapor collection system from the pressure-sensing device. The pressure measured by the sensing device must be corrected for pressure drops across any barge piping, hoses, or arms that are used to inject the fluid.

(d) A fluid displacement system must provide a pressure-sensing device that is independent of the device required by paragraph (c) of this section. This pressure-sensing device must activate the fluid displacement system emergency shutdown and close the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a). It must also close the remotely operated shutoff valve required by 33 CFR 154.2202(c) when the pressure at the fluid injection connection reaches 90 percent of the lowest setting of any pressure relief valve on the barge. The pressure-sensing device must be located in the fluid displacement system's piping downstream of any device that could potentially isolate the barge's VCS from the pressure-sensing device. The pressure measured by the sensing device must be corrected for pressure drops across any barge piping, hoses, or arms that are used to inject the fluid.

(e) If a vapor-moving device capable of drawing more than 0.5 pounds per square inch gauge (psig) vacuum is used to draw vapor, air, inert gas, or other medium from the barge, a vacuum relief valve must be installed on the facility's fixed vapor collection system piping between the facility vapor connection and the vapor-moving device. The vacuum relief valve must—

(1) Relieve at a pressure such that the pressure at the facility vapor connection is maintained at or above 14.2 pounds per square inch absolute (psia) (-0.5 psig);

(2) Have a relieving capacity equal to or greater than the maximum capacity of the vapor-moving device;

(3) Have a flame arrester or flame screen fitted at the vacuum relief opening;

(4) Have been tested for relieving capacity in accordance with paragraph 1.5.1.3 of API 2000 (incorporated by reference, *see* 33 CFR 154.106), with a flame arrester or flame screen fitted; and

(5) Be constructed of materials compatible with the vapors being gas-freed.

(f) The vacuum relief valve requirements of paragraph (e) of this section may include a valve to isolate it from the facility vapor collection piping, provided—

(1) The isolation valve must be interlocked with any vapor-moving device such that the vapor-moving device cannot activate unless the isolation valve is in the full open position (*i.e.,* the vacuum relief valve is not isolated); and

(2) The isolation valve can only be closed after the facility person in charge has acknowledged that the hatch opening required by 33 CFR 154.2250(i) is open and secured.

(g) If a vapor-moving device capable of drawing more than 0.5 psig vacuum is used to draw vapor, air, inert gas, or other medium from the barge, the facility must install portable, intrinsically safe, pressure-sensing devices on any cargo tank at the connection required by 46 CFR 39.6003(b) before any cleaning operation begins on the tank. A pressure-sensing device must be provided that—

(1) Activates an alarm that satisfies 33 CFR 154.2100(e) when the pressure in the cargo tank being cleaned falls below 80 percent of the highest setting of any of the barge's vacuum relief valves, or a higher pressure agreed upon by the facility and barge persons in charge; and

(2) Activates the emergency shutdown system for the vapor-moving device and closes the remotely operated cargo vapor shutoff valve described in 33 CFR 154.2101(a) when the pressure in the cargo tank being cleaned falls below 90 percent of the highest setting of any of the barge's vacuum relief valves, or a higher pressure agreed upon by the facility and barge persons in charge. This pressure-sensing device must be independent of the device used to activate an alarm required by paragraph (g)(1) of this section.

(h) The pressure-sensing devices required by paragraph (g) of this section must—

(1) Have suitable means, such as approved intrinsic safety barriers that are able to accept passive devices, so that the under-pressure alarm circuits of the barge side of the under-pressure control system, including cabling, normally closed switches, and pin and sleeve connectors, are intrinsically safe;

(2) Be connected to the under-pressure alarm system by a four-wire, 16-ampere shielded flexible cable; and

(3) Have cable shielding grounded to the under-pressure alarm system.

(i) A pressure-indicating device must be provided within 6 meters (19.7 feet) of the facility vapor connection which displays the pressure in the vapor collection line upstream of any isolation valve and any devices, such as strainers, that could cause a blockage in the vapor line.

(j) A fluid displacement system must include a pressure-indicating device that displays the pressure in the fluid displacement system injection line. This device must be within 6 meters (19.7 feet) of the fluid injection connection.

(k) If a fluid displacement system used to inject inert gas or another medium into the cargo tank of a barge being gas-freed is capable of producing a pressure greater than 2 psig, a pressure relief valve must be installed in the fluid displacement system injection line between the fluid injection source and the fluid injection connection that—

(1) Relieves at a predetermined pressure such that the pressure in the fluid displacement system at the fluid injection connection does not exceed 1.5 psig;

(2) Has a relieving capacity equal to or greater than the maximum volumetric flow capacity of the fluid displacement system;

(3) Has a flame screen or flame arrester fitted at the relief opening; and

(4) Has been tested for relieving capacity in accordance with paragraph 1.5.1.3 of API 2000, when fitted with a flame screen or flame arrester.

(l) When using the fluid displacement system, if the pressure in the facility's fixed vapor collection system can exceed 2 psig during a malfunction in an inerting, enriching, or diluting system, a pressure relief valve must—

(1) Be installed between the point where inerting, enriching, or diluting gas is added to the facility's fixed vapor collection system piping and the facility vapor connection;

(2) Relieve at a predetermined pressure such that the pressure at the facility vapor connection does not exceed 1.5 psig;

(3) Have a relieving capacity equal to or greater than the maximum capacity of the facility's inerting, enriching, or diluting gas source;

(4) Have a flame screen or flame arrester fitted at the relief opening;

(5) Have been tested for relieving capacity in accordance with paragraph 1.5.1.3 of API 2000, when fitted with a flame screen or flame arrester; and

(6) Be constructed of materials compatible with the vapors being gas-freed.

(m) For fluid displacement systems, the fluid injection connection must be electrically insulated from the fluid injection source in accordance with OCIMF ISGOTT section 17.5 (incorporated by reference, *see* 33 CFR 154.106).

(n) If the pressure relief valve is not designed with a minimum vapor discharge velocity of 30 meters (98.4 feet) per second, the relieving capacity test required by paragraphs (k)(4) and (l)(5) of this section must be carried out with a flame screen or flame arrester fitted at the discharge opening.

(o) A pressure indicating device must be provided by the facility for installation at the connection required by 46 CFR 39.6003(b).

§ 154.2204 Fire, explosion, and detonation protection.

This section applies to tank barge cleaning facilities (TBCFs) collecting vapors of flammable, combustible, or non-high flash point liquid cargoes.

(a) A vapor control system (VCS) with a single facility vapor connection that processes vapor with a vapor recovery unit must—

(1) Have a detonation arrester located as close as practicable to the facility vapor connection. The total pipe length between the detonation arrester and the facility vapor connection must not exceed 18 meters (59.1 feet); or

(2) Have an inerting, enriching, or diluting system that meets the requirements of 33 CFR 154.2107.

(b) A VCS with a single facility vapor connection that processes vapor with a vapor destruction unit must—

(1) Have a detonation arrester located as close as practicable to the facility vapor connection. The total pipe length between the detonation arrester and the facility vapor connection must not exceed 18 meters (59.1 feet); and

(2) Have an inerting, enriching, or diluting system that meets the requirements of 33 CFR 154.2107.

(c) A VCS with multiple facility vapor connections that processes vapor with a vapor recovery unit must have a detonation arrester located as close as practicable to each facility vapor connection. The total pipe length between the detonation arrester and each facility vapor connection must not exceed 18 meters (59.1 feet).

(d) A VCS with multiple facility vapor connections that processes vapor with a vapor destruction unit must—

(1) Have a detonation arrester located as close as practicable to each facility vapor connection. The total pipe length between the detonation arrester and each facility vapor connection must not exceed 18 meters (59.1 feet); and

(2) Have an inerting, enriching, or diluting system that meets the requirements of 33 CFR 154.2107.

(e) 33 CFR 154.2105(j) applies to a TBCF's VCS.

Tank Barge Cleaning Facilities—Operations

§ 154.2250 General requirements.

(a) No tank barge cleaning operation using a vapor control system (VCS) may be conducted unless the facility operator has a copy of the facility operations manual, with the VCS addendum, marked by the local Coast Guard Captain of the Port (COTP) as required by 33 CFR 154.325(d).

(b) The facility person in charge must ensure that a facility can receive vapors only from a barge with a VCS that has been approved by the Coast Guard Marine Safety Center as meeting the requirements of 46 CFR 39.6000.

(c) The facility person in charge must ensure that safety system tests are conducted as follows:

(1) Pressure sensors, alarms, and automatic shutdown systems required by 33 CFR 154.2203, except as exempted by paragraph (c)(2) or (c)(3) of this section, must be tested by applying the test pressure at the sensors not more than 24 hours before each cleaning operation;

(2) The pressure sensors required by 33 CFR 154.2203 may meet the test program in accordance with 33 CFR 154.2180 and 33 CFR 154.2181 instead of the test within 24 hours before each cleaning operation as required by paragraph (c)(1) of this section;

(3) Visible and audible alarm indicators must be tested not more than 24 hours before each cleaning operation;

(4) The analyzers required by 33 CFR 154.2105(j) and 154.2107(d) and (e), except as exempted by paragraph (c)(5) of this section, must be checked for calibration response by use of a span gas not more than 24 hours before each cleaning operation;

(5) The analyzers required by 33 CFR 154.2105(j) and 154.2107(d) and (e) may be checked for calibration response by use of a span gas as defined by the test program contained in 33 CFR 154.2180 and 33 CFR 154.2181, and comply with the minimum requirements as defined in 33 CFR 154.2180 and 33 CFR 154.2181, instead of as provided by paragraph (c)(4) of this section; and

(6) The vacuum and pressure relief valves required by 33 CFR 154.2203 must be checked not more than 24 hours before each cleaning operation to make sure they are operating without constraint and that any required flame screens or flame arresters are not damaged.

(d) The facility person in charge must verify the following before beginning cleaning operations:

(1) Each valve in the vapor collection system between the barge's cargo tank and the facility vapor collection system is correctly positioned to allow the collection of vapors;

(2) A vapor collection hose or arm is connected to the barge's vapor collection system;

(3) The electrical insulating devices required by 33 CFR 154.2101(g) and 154.2203(m) are installed;

(4) The maximum allowable gas-freeing rate as determined by the lesser of the following:

(i) A gas-freeing rate corresponding to the maximum vapor processing rate for the tank barge cleaning facility's (TBCF's) VCS, as specified in the facility operations manual; or

(ii) The barge's maximum gas-freeing rate determined in accordance with 46 CFR 39.6007(c);

(5) The gas-freeing rate does not exceed the maximum allowable gas-freeing rate as determined in paragraph (d)(4) of this section;

(6) The maximum allowable stripping rate is determined and does not exceed the volumetric capacity of the barge's vacuum relief valve at the valve's setpoint for the cargo tank being stripped;

(7) The barge's maximum and minimum operating pressures;

(8) Each vapor collection hose has no unrepaired or loose covers, kinks, bulges, soft spots, or any other defects that would permit the discharge of vapor through the hose material; and no external gouges, cuts, or slashes that penetrate the first layer of hose reinforcement;

(9) The freezing point of each cargo. If there is a possibility that the ambient air temperature during cleaning operations will be at or below the freezing point of the cargo, adequate precautions have been taken to prevent freezing of vapor or condensate, or to detect and remove the frozen liquid and condensate to prevent accumulation; and

(10) The cargo vapor is evaluated for the potential to polymerize, and adequate precautions have been taken to prevent and detect polymerization of the cargo vapors.

(e) A vapor collection system must not be used unless the following tests and inspections are completed to the satisfaction of the facility person in charge:

(1) Each vapor collection hose, vapor collection arm, pressure or vacuum relief valve, and pressure sensor is tested and inspected in accordance with 33 CFR 156.170(b), (c), and (f);

(2) Each remote operating or indicating device is tested for proper operation in accordance with 33 CFR 156.170(f); and

(3) Each required detonation arrester has been inspected internally within the last year, or more frequently if operational experience has shown that frequent clogging or rapid deterioration is likely.

(f) If one or more analyzers required by 33 CFR 154.2107(d) and (e) become inoperable during gas-freeing operations, the operation may continue, provided that at least one analyzer remains operational; however, no further gas-freeing operations may be started until all inoperable analyzers are repaired or replaced.

(g) Whenever a condition results in a shutdown of the VCS, the cleaning operations must be immediately terminated. The operation may not resume until the cause of the shutdown has been investigated and corrective action taken.

(h) If it is suspected that a flare in the VCS has had a flashback, or if a flame is detected on a detonation arrester required by 33 CFR 154.2109(c)(2), the cleaning operation must be stopped and may not resume until the detonation arrester and any quick-closing stop valves downstream of the detonation arrester have been inspected and found to be in satisfactory condition.

(i) If a vacuum displacement system is used for gas-freeing, the facility person in charge of the cleaning operation must verify the following items:

(1) The minimum amount of open area for air flow on the barge has been determined so that the pressure in the cargo tank cannot be less than 14.5 pounds per square inch absolute (psia) (−0.2 pounds per square inch gauge (psig)) at the maximum flow capacity of the vapor-moving device;

(2) Any hatch or fitting providing the minimum open area has been secured open so that accidental closure is not possible; and

(3) The hatch and/or fitting must be opened before the pressure in the cargo tank falls below 10 percent of the highest setting of any of the barge's vacuum relief valves.

(j) 33 CFR 154.2150(p) and (q) apply to a TBCF's VCS.

Appendix B to Part 154 [Removed and Reserved]

10. Remove and reserve Appendix B to part 154.

PART 155—OIL OR HAZARDOUS MATERIAL POLLUTION PREVENTION REGULATIONS FOR VESSELS

11. The authority citation for part 155 is revised to read as follows:

Authority: 33 U.S.C. 1225, 1231, 1321(j), 1903(b); 46 U.S.C. 3703; E.O. 11735, 3 CFR,

1971–1975 Comp., p. 793; Department of Homeland Security Delegation No. 0170.1. Section 155.490 also issued under section 4110(b) of Pub. L. 101–380.

§ 155.750 [Amended]

12. In § 155.750(d)—

a. Remove the citation "46 CFR 39.30–1(d)(1) through (d)(3)", wherever it appears, and add, in its place, the citation "46 CFR 39.3001(d)(1) through (d)(3);

b. Remove the citation "46 CFR 39.30–1(b)", wherever it appears, and add, in its place, the citation "46 CFR 39.3001(c)"; and

c. Remove the citation "46 CFR 39.30–1(h)", wherever it appears, and add, in its place, the citation "46 CFR 39.3001(g)".

PART 156—OIL AND HAZARDOUS MATERIAL TRANSFER OPERATIONS

13. The authority citation for part 156 is revised to read as follows:

Authority: 33 U.S.C. 1225, 1231, 1321(j); 46 U.S.C. 3703, 3703a, 3715; E.O. 11735, 3 CFR 1971–1975 Comp., p. 793; Department of Homeland Security Delegation No. 0170.1.

14. In § 156.120—

a. Revise paragraph (aa) introductory text to read as set out below;

b. In paragraph (aa)(4), remove the word "loading" and add, in its place, the word "transfer";

c. In paragraph (aa)(7) introductory text, after the words "the transfer operation", add the words "or in accordance with 33 CFR 154.2150(b)";

d. In paragraph (aa)(7)(ii), remove the words "§ 154.820(a), § 154.824(d) and (e) of this chapter" and add, in their place, the words "33 CFR 154.2105(a) and (j) and 154.2107(d) and (e)";

e. Revise paragraph (aa)(9) to read as set out below;

f. Add paragraphs (aa)(10), (aa)(11), and (aa)(12) to read as follows:

§ 156.120 Requirements for transfer.

* * * * *

(aa) A transfer operation which includes collection of vapor emitted to or from a vessel's cargo tanks through a vapor control system (VCS) not located on the vessel must have the following verified by the person in charge:

* * * * *

(9) The oxygen content in the vapor space of each of the vessel's cargo tanks connected to the vapor collection system, if inerted, is—

(i) At or below 60 percent by volume of the cargo's minimum oxygen concentration for combustion; or

(ii) At or below 8 percent by volume, at the start of cargo transfer, for vapor of crude oil, gasoline blends, or benzene;

(10) The freezing point of each cargo has been determined. If there is a possibility that the ambient air temperature during transfer operations will be at or below the freezing point of the cargo, adequate precautions have been taken to prevent freezing of vapor or condensate, or to detect and remove the liquid condensate and solids to prevent accumulation;

(11) If the cargo has the potential to polymerize, adequate precautions have been taken to prevent and detect polymerization of the cargo vapors; and

(12) The VCS has been cleaned, in accordance with 33 CFR 154.2150(p), between transfers of incompatible cargoes.

* * * * *

15. In § 156.170—

a. In paragraph (g), after the words "collects vapor emitted", add the words "to or";

b. In paragraph (g)(3), remove the words "and § 154.828(a) of this chapter or 46 CFR 39.40–3(d), and each flame arrester required by § 154.826(a), § 154.828(a) and (c) of this chapter" and add, in their place, the words "33 CFR 154.2109, 154.2110, and 154.2111 or 46 CFR 39.4003, and each flame arrester required by 33 CFR 154.2105(j)";

c. In paragraph (g)(4), remove the words "§ 154.820(a) and § 154.824(d) and (e) of this chapter" and add, in their place, the words "33 CFR 154.2105(a) and (j), 154.2107(d) and (e), and 154.2110"; and

d. Add new paragraph (i) to read as follows:

§ 156.170 Equipment tests and inspections.

* * * * *

(i) Upon the request of the owner or operator, the Commandant may approve alternative methods of compliance to the testing and inspection requirements of paragraph (g)(3) of this section if the Commandant determines that the alternative methods provide an equivalent level of safety and protection from fire, explosion, and detonation. Criteria to consider when evaluating requests for alternative methods may include, but are not limited to: Operating and inspection history, type of equipment, new technology, and site-specific conditions that support the requested alternative.

46 CFR—SHIPPING

PART 35—OPERATIONS

16. The authority citation for part 35 is revised to read as follows:

Authority: 33 U.S.C. 1225, 1231, 1321(j); 46 U.S.C. 3306, 3703, 6101; 49 U.S.C. 5103, 5106; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; E.O. 12777, 56 FR 54757, 3 CFR, 1991 Comp., p. 351; Department of Homeland Security Delegation No. 0170.1.

17. Revise § 35.35–5 to read as follows:

§ 35.35–5 Electrical bonding—TB/ALL.

A vessel must use an insulating flange or one continuous length of nonconductive hose between the vessel and the shore transfer facility. The operator may not use external cables or straps to achieve electrical bonding.

18. In § 35.35–20—

a. In paragraph (m) introductory text, after the words "collection of cargo vapor", add the words "to or";

b. In paragraph (m)(1), after the words "vapor to flow to", add the words "or from"; and

c. Revise paragraph (m)(9) to read as follows:

§ 35.35–20 Inspection before transfer of cargo—TB/ALL.

* * * * *

(m) * * *

(9) The oxygen content in the vapor space of each of the vessel's inerted cargo tanks connected to the vapor collection system is—

(i) At or below 60 percent by volume of the cargo's minimum oxygen concentration for combustion at the start of cargo transfer; or

(ii) At or below 8 percent by volume, at the start of cargo transfer, for vapor of crude oil, gasoline blends, or benzene.

19. In § 35.35–30—

a. In paragraph (c) introductory text, after the words "collection of cargo vapor", add the words "to or";

b. In paragraph (c)(1), after the words "vapor to flow to", add the words "or from"; and

c. Revise paragraph (c)(8) to read as follows:

§ 35.35–30 "Declaration of Inspection" for tank vessels—TB/ALL.

* * * * *

(c) * * *

(8) Has the oxygen content in the vapor space of each of the vessel's inerted cargo tanks connected to the vapor collection system been verified to be—

(i) At or below 60 percent by volume, at the start of cargo transfer, of the cargo's minimum oxygen concentration for combustion; or

(ii) At or below 8 percent by volume, at the start of cargo transfer, for vapor of crude oil, gasoline blends, or benzene.

20. Revise part 39 to read as follows:

PART 39—VAPOR CONTROL SYSTEMS

Subpart 39.1000—General

Subpart 39.2000—Equipment and Installation

Subpart 39.3000—Vapor Collection Operations During Cargo Transfer

Subpart 39.4000—Vessel-to-Vessel Transfers Using Vapor Balancing

Subpart 39.5000—Multi-Breasted Loading Using a Single Facility Vapor Connection

Subpart 39.6000—Tank Barge Cleaning Operations With Vapor Collection

Authority: 33 U.S.C. 1225, 1231; 42 U.S.C. 7511b(f)(2); 46 U.S.C. 3306, 3703, 3715(b); E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; Department of Homeland Security Delegation No. 0170.1.

Subpart 39.1000—General

§ 39.1001 Applicability—TB/ALL.

(a) This part applies to tank vessels that use a vapor control system (VCS) to collect vapors emitted to or from a vessel's cargo tanks while operating in the navigable waters of the United States, except—

(1) Tank vessels with an operating vapor collection system approved by the Coast Guard prior to July 23, 1990, for the collection and transfer of cargo vapor to specific facilities. Such tank vessels are only subject to 46 CFR 39.1013, 39.3001, and 39.4005; and

(2) A tank barge that collects vapors emitted from its cargo tanks during gas-freeing or cleaning operations at a cleaning facility. This type of tank barge is only subject to 46 CFR part 39, subparts 39.1000 and 39.6000, and must comply with requirements of these two subparts at the time of its next inspection for certification required by 46 CFR 31.10–15, but no later than [DATE 5 YEARS AFTER EFFECTIVE DATE OF FINAL RULE].

(b) This part does not apply to the collection of vapors of liquefied flammable gases as defined in 46 CFR 30.10–39.

(c) In this part, regulatory measurements, whether in the metric or English system, are sometimes followed by approximate equivalent measurements in parentheses, which are given solely for the reader's convenience. Regulatory compliance with the regulatory measurement is required.

§ 39.1003 Definitions—TB/ALL.

As used in this part only:

Barge vapor connection means the point in a barge's piping system where it connects to a vapor collection hose or arm. This may be the same as the barge's cargo connection while controlling vapors during tank barge cargo tank-cleaning operations.

Cargo deck area means that part of the weather deck that is directly over the cargo tanks.

Cargo tank venting system means the venting system required by 46 CFR 32.55.

Certifying entity means a certifying entity accepted by the Coast Guard as such pursuant to 33 CFR part 154, subpart P.

Cleaning facility means a facility used or capable of being used to conduct cleaning operations on a tank barge.

Cleaning operation means any stripping, gas-freeing, or tank-washing operation of a barge's cargo tanks conducted at a cleaning facility.

Commandant means the Commandant (CG–522), U.S. Coast Guard, 2100 2nd St., SW., Stop 7126, Washington, DC 20593–7126.

Facility vapor connection means the point in a facility's fixed vapor collection system where the system connects with the vapor collection hose or the base of the vapor collection arm.

Fixed stripping line means a pipe extending to the low point of each cargo tank, which is welded through the deck and terminated above deck with a valve, and plugged at the open end.

Flammable liquid means a liquid as defined in 46 CFR 30.10–22.

Fluid displacement system means a system that removes vapors from a barge's cargo tanks during gas freeing through the addition of an inert gas or other medium into the cargo tank.

Fluid injection connection means the point in a fluid displacement system at which the fixed piping or hose that supplies the inert gas or other medium connects to a barge's cargo tanks or fixed piping system.

Gas freeing means the removal of vapors from a tank barge.

Independent as applied to two systems means that one system will operate when there is a failure of any part of the other system.

Inerted means the oxygen content of the vapor space in a cargo tank is reduced in accordance with the inert gas requirements of 46 CFR 32.53 or 153.500. If a cargo vapor in a cargo tank that is connected to the vapor collection system is defined as inerted at the start of cargo transfer, the oxygen content in the vapor space of the cargo tank must not exceed 60 percent by volume of the cargo's minimum oxygen concentration for combustion, or 8 percent by volume for vapor of crude oil, gasoline blends, or benzene.

Marine Safety Center (MSC) means the Commanding Officer, U.S. Coast Guard Marine Safety Center, 2100 2nd Street, SW., Stop 7102, Washington, DC 20593–7102.

Maximum allowable gas-freeing rate means the maximum volumetric rate at which a barge may be gas-freed during cleaning operations.

Maximum allowable stripping rate means the maximum volumetric rate at which a barge may be stripped during cleaning operations prior to the opening

of any hatch and/or fitting on the cargo tank being stripped.

Maximum allowable transfer rate means the maximum volumetric rate at which a vessel may receive cargo or ballast.

Minimum oxygen concentration for combustion (MOCC) means the lowest level of oxygen in a vapor or vapor mixture that will support combustion.

New vapor collection system means a vapor collection system that is not an existing vapor collection system.

Service vessel means a vessel that transports bulk liquid cargo between a facility and another vessel.

Set pressure means the pressure at which the pressure or vacuum valve begins to open and the flow starts through the valve.

Stripping means the removal, to the maximum extent practicable, of cargo residue remaining in the barge's cargo tanks and associated fixed piping system after cargo transfer or during cleaning operations.

Vacuum displacement system means a system that removes vapors from a barge's cargo tanks during gas-freeing by sweeping air through the cargo tank hatch openings.

Vapor balancing means the transfer of vapor displaced by incoming cargo from the tank of a vessel or facility receiving cargo into a tank of the vessel or facility delivering cargo via a vapor collection system.

Vapor collection system means an arrangement of piping and hoses used to collect vapor emitted to or from a vessel's cargo tanks and to transport the vapor to a vapor processing unit or a tank.

Vapor control system (VCS) means an arrangement of piping and equipment used to control vapor emissions collected to or from a vessel. It includes the vapor collection system and vapor processing unit or a tank.

Vapor processing unit means the components of a VCS that recover, destroy, or disperse vapor collected from a vessel.

Vessel-to-vessel transfer (direct or through a shore loop) means either—

(1) The transfer of a bulk liquid cargo from a tank vessel to a service vessel; or

(2) The transfer of a bulk liquid cargo from a service vessel to another vessel in order to load the receiving vessel to a deeper draft.

Vessel vapor connection means the point in a vessel's fixed vapor collection system where the system connects with the vapor collection hose or arm.

§ 39.1005 Incorporation by reference—TB/ALL.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, the Coast Guard must publish notice of change in the **Federal Register** and the material must be available to the public. All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030 or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.* Also, it is available for inspection at the Coast Guard, Office of Operating and Environmental Standards (CG–522) 2100 2nd Street, SW., Stop 7126, Washington, DC 20593–7126, and is available from the sources indicated in this section.

(b) American Petroleum Institute (API), 1220 L Street, NW., Washington, DC 20005.

(1) API Standard 2000, Venting Atmospheric and Low-Pressure Storage Tanks (Non-refrigerated and Refrigerated), Third Edition, January 1982 (reaffirmed December 1987)("API 2000"), incorporation by reference (IBR) approved for 46 CFR 39.2011.

(2) [Reserved]

(c) American National Standards Institute (ANSI), 25 West 43rd Street, 4th floor, New York, NY 10036.

(1) ANSI B16.5, Steel Pipe Flanges and Flanged Fittings, 1981, IBR approved for 46 CFR 39.2001 and 39.6001.

(2) [Reserved]

(d) American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959.

(1) ASTM F1122—Standard Specification for Quick Disconnect Couplings, 1992, IBR approved for 46 CFR 39.2001.

(2) ASTM F1271—Standard Specification for Spill Valves for Use in Marine Tank Liquid Overpressure Protection Applications, December 29, 1989, IBR approved for 46 CFR 39.2009.

(e) International Electrotechnical Commission (IEC), Bureau Central de la Commission Electrotechnique Internationale, 3, rue de Varembé, P.O. Box 131, CH—1211 Geneva 20, Switzerland.

(1) IEC 60309–1—Plugs, Socket-Outlets and Couplers for Industrial Purposes—Part 1: General Requirements, Edition 4.1 2005–12, IBR approved for 46 CFR 39.2009.

(2) IEC 60309–2—Plugs, Socket-Outlets and Couplers for Industrial Purposes—Part 2: Dimensional Interchangeability Requirements for Pin and Contact-tube Accessories, Edition 4.1 2005–12, IBR approved for 46 CFR 39.2009.

(f) International Maritime Organization (IMO), 4 Albert Embankment, London SE1 7SR, United Kingdom.

(1) International Convention for the Safety of Life at Sea, Consolidated Text of the 1974 SOLAS Convention, the 1978 SOLAS Protocol, the 1981 and 1983 SOLAS Amendments (1986) ("SOLAS"), IBR approved for 46 CFR 39.2001.

(2) [Reserved]

(g) National Electrical Manufacturers Association (NEMA), 1300 North 17th Street, Suite 1752, Rosslyn, VA 22209.

(1) ANSI/NEMA WD–6—Wiring Devices, Dimensional Requirements, 1988 ("NEMA WD–6"), IBR approved for 46 CFR 39.2009.

(2) [Reserved]

(h) National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169–7471.

(1) NFPA 70—National Electrical Code, 1987, IBR approved for 46 CFR 39.2009.

(2) [Reserved]

(i) Oil Companies International Marine Forum (OCIMF), 29 Queen Anne's Gate, London SWIH 9BU, England.

(1) International Safety Guide for Oil Tankers and Terminals, Fifth Edition, 2006 ("ISGOTT"), IBR approved for 46 CFR 39.3001, 39.5001, 39.6001, and 39.6005.

(2) [Reserved]

§ 39.1009 Additional tank vessel vapor processing unit requirements—TB/ALL.

(a) Vapor piping, fitting, valves, flanges, and pressure vessels comprising the construction and installation of a permanent or portable vapor processing unit onboard a tank vessel must meet the marine engineering requirements of 46 CFR chapter I, subchapter F.

(b) Electrical equipment comprising the construction and installation of a permanent or portable vapor processing unit onboard a tank vessel must meet the electrical engineering requirements of 46 CFR chapter I, subchapter J.

(c) In addition to complying with the rules of this part, tank vessels with a permanent or portable vapor processing unit must meet the requirements of 33 CFR part 154, subpart P to the satisfaction of the Commandant.

(d) When the requirements of 46 CFR chapter I, subchapters F and J, conflict with 33 CFR part 154, subpart P, the requirements of 46 CFR chapter I, subchapters F and J apply, unless specifically authorized by the Marine Safety Center.

§ 39.1011 Personnel training requirements—TB/ALL.

Personnel responsible for operating the vapor control system (VCS) must complete a training program prior to the operation of the system installed onboard the tank vessel. As part of the training program, personnel must be able to demonstrate, through drills and practical knowledge, the proper VCS operation procedures for normal and emergency conditions. The training program must cover the following subjects:

(a) Purpose of a VCS;

(b) Principles of the VCS;

(c) Components of the VCS;

(d) Hazards associated with the VCS;

(e) Coast Guard regulations in this part;

(f) Vapor control operation procedures during cargo transfer or tank barge cleaning, including:

(1) Testing and inspection requirements;

(2) Pre-transfer or pre-cleaning procedures;

(3) Connection sequence;

(4) Startup procedures; and

(5) Normal operations; and

(g) Emergency procedures.

§ 39.1013 U.S.-flagged tank vessel certification procedures for vapor control system designs—TB/ALL.

(a) For an existing Coast Guard-approved vapor control system (VCS) that has been operating before July 23, 1990, the tank vessel owner or operator must submit detailed engineering drawings, calculations, and specifications to the Marine Safety Center (MSC) for review and approval before modifying the system or transferring vapor to a facility that was not approved by the Coast Guard for that kind of vapor transfer.

(b) For a Coast Guard-approved VCS that has been operating since July 23, 1990, the tank vessel owner or operator must submit plans, calculations, and specifications to the MSC for review and approval before modifying the system.

(c) A tank vessel owner or operator must submit plans, calculations, and specifications for a new tank vessel VCS to the MSC for review and approval before installing the system. A permanent or portable vapor processing unit onboard a tank vessel will be reviewed, together with the tank vessel, as a complete and integrated system.

(d) Once the plan review and inspection of the tank vessel VCS satisfy the requirements of this part, the Officer in Charge, Marine Inspection (OCMI) will endorse the Certificate of Inspection for the U.S.-flagged tank vessel.

§ 39.1015 Foreign-flagged tank vessel certification procedures for vapor control system designs—TB/ALL.

As an alternative to meeting the requirements in 33 CFR 39.1013(a), (b), and (c), the owner or operator of a foreign-flagged tank vessel may submit certification by the classification society that classifies vessels under their foreign flags to the Marine Safety Center. Upon receipt of the certification stating that the vapor control system (VCS) meets the requirements of this part, the Officer in Charge, Marine Inspection (OCMI) will endorse the vessel's Certificate of Compliance for foreign-flagged tank vessels.

§ 39.1017 Additional certification procedures for a tank barge vapor collection system design—B/ALL.

(a) For a tank barge vapor collection system intended for operation in multi-breasted loading using a single facility vapor connection, the tank barge owner or operator must submit plans, calculations, and specifications to the Marine Safety Center (MSC) for review and approval before beginning a multi-breasted loading operation.

(b) For a tank barge intended for collecting vapors emitted from its cargo tanks during gas-freeing or cleaning operations at a cleaning facility, the barge owner or operator must submit the following items to the MSC for review and approval:

(1) Stripping system plans and specifications; and

(2) Stripping and/or gas-freeing rate calculations.

(c) Once the vapor collection system satisfies the requirements of this part, the Officer in Charge, Marine Inspection (OCMI) will endorse the Certificate of Inspection that the tank barge is acceptable for collecting vapors during cleaning operations.

Subpart 39.2000—Equipment and Installation

§ 39.2001 Vapor collection system—TB/ALL.

(a) Vapor collection piping must be fixed piping and the vessel's vapor connection must be located as close as practicable to the loading manifold, except—

(1) As allowed by the Commandant; and

(2) A vessel certificated to carry cargo listed in 46 CFR, part 151, Table 151.05 or part 153, Table 1 may use flexible hoses no longer than three meters (9.84 feet) for interconnection between fixed piping onboard the vessel to preserve segregation of cargo systems. These flexible hoses must also meet the requirements in paragraph (i) of this section, excluding paragraph (i)(5), and meet the following additional requirements:

(i) The installation of flexible hoses must include an isolation valve mounted on the tank side of the connection; and

(ii) Hose connections permitted under paragraph (a)(2) of this section are exempt from the requirements of paragraph (h) of this section.

(b) When collecting incompatible vapors simultaneously, vapors must be kept separate throughout the entire vapor collection system.

(c) Vapor collection piping must be electrically bonded to the hull and must be electrically continuous.

(d) The vapor collection system must have a mechanism to eliminate liquid condensation, such as draining and collecting liquid from each low point in the line.

(e) For a tankship that has an inert gas system, a mechanism must be in place to isolate the inert gas supply from the vapor control system (VCS). The inert gas main isolation valve required by chapter II–2, Regulation 62.10.8 of SOLAS (incorporated by reference, *see* 46 CFR 39.1005), may be used to satisfy this requirement.

(f) The vapor collection system must not interfere with the proper operation of the cargo tank venting system.

(g) The tank vessel owner or operator must install an isolation valve capable of manual operation. It must be located at the vessel vapor connection and must clearly show whether the valve is in the open or closed position via an indicator, valve handle, or valve stem.

(h) The last 1.0 meter (3.3 feet) of vapor piping upstream of the vessel vapor connection and each end of a vapor hose must be—

(1) Painted in the sequence of red/yellow/red. The width of the red bands must be 0.1 meter (0.33 foot) and the width of the middle yellow band must be 0.8 meter (2.64 feet); and

(2) Labeled with the word "VAPOR" painted in black letters at least 50.8 millimeters (2 inches) high.

(i) Hoses that transfer vapors must meet the following requirements:

(1) Have a design burst pressure of at least 25 pounds per square inch gauge (psig);

(2) Have a maximum allowable working pressure no less than 5 psig;

(3) Be capable of withstanding at least a 2.0 pounds per square inch (psi) vacuum without collapsing or constricting;

(4) Be electrically continuous with a maximum resistance of 10,000 ohms;

(5) Have flanges with—

(i) A bolthole arrangement complying with the requirements for 150 pound

class ANSI B16.5 flanges (incorporated by reference, *see* 46 CFR 39.1005); and

(ii) One or more 15.9 millimeter (0.625 inch) diameter hole(s) located midway between boltholes and in line with the bolthole pattern; and

(6) Be abrasion and kinking resistant.

(j) Each vessel vapor connection flange face must have a permanent stud projecting outward that has a 12.7 millimeter (0.5 inch) diameter and is at least 25.4 millimeters (1 inch) long. It must be located at the top of the flange face, midway between boltholes, and in line with the bolthole pattern.

(k) Quick disconnect couplings (QDCs) may be used instead of flanges at the flexible hose connection and fixed piping on tankships provided they meet ASTM F1122 (incorporated by reference, *see* 46 CFR 39.1005) and are designed as "Standard Class QDC."

(l) Hose saddles that provide adequate support to prevent kinking or collapse of hoses must accompany vapor hose handling equipment.

(m) For cargoes that have toxic properties, listed in 46 CFR Table 151.05 with the "Special requirements" column referring to 46 CFR 151.50–5, an overfill alarm and shutdown system that meet the requirements of 46 CFR 39.2007(a), 39.2009(a), or 39.2009(b) must be used for primary overfill protection. If the vessel is also equipped with spill valves or rupture disks, their setpoints must be set higher than the vessel's pressure relief valve setting as required by 46 CFR 39.2009(c)(1).

§ 39.2003 Cargo gauging system—TB/ALL.

(a) A cargo tank of the tank vessel connected to a vapor collection system must be equipped with a permanent or portable cargo gauging device that—

(1) Is a closed type as defined in 46 CFR 151.15.10(c) that does not require opening the tank to the atmosphere during cargo transfer;

(2) Allows the operator to determine the level of liquid in the tank for the full range of liquid levels in the tank;

(3) Has an indicator for the level of liquid in the tank that is located where cargo transfer is controlled; and

(4) If portable, is installed on the tank during the entire transfer operation.

(b) Each cargo tank of a tank barge must have a high-level indicating device, unless the barge complies with 46 CFR 39.2009(a). The high-level indicating device must—

(1) Indicate visually the level of liquid in the cargo tank when the liquid level is within a range of 1 meter (3.28 feet) of the top of the tank;

(2) Show a permanent mark to indicate the maximum liquid level permitted under 46 CFR 39.3001(e) at even keel conditions; and

(3) Be visible from all cargo control areas.

§ 39.2007 Tankship liquid overfill protection—T/ALL.

(a) Each cargo tank of a tankship must be equipped with an intrinsically safe high-level alarm and a tank overfill alarm.

(b) If installed after July 23, 1990, the high-level alarm and tank overfill alarm required by paragraph (a) of this section must—

(1) Be independent of each other;

(2) Activate an alarm in the event of loss of power to the alarm system;

(3) Activate an alarm during the failure of electrical circuitry to the tank level sensor; and

(4) Be able to be inspected at the tank for proper operation prior to each transfer. This procedure may be achieved with the use of an electronic self-testing feature that monitors the condition of the alarm circuitry and sensor.

(c) The high-level alarm required by paragraph (a) of this section must—

(1) Activate an alarm once the cargo level reaches 95 percent of the tank capacity or higher, but before the tank overfill alarm;

(2) Be identified with the legend "High-level Alarm" in black letters at least 50.8 millimeters (2 inches) high on a white background; and

(3) Activate a visible and audible alarm so that it can be seen and heard on the vessel where cargo transfer is controlled.

(d) The tank overfill alarm required by paragraph (a) of this section must—

(1) Be independent of the cargo gauging system;

(2) Be identified with the legend "TANK OVERFILL ALARM" in black letters at least 50.8 millimeters (2 inches) high on a white background;

(3) Activate a visible and audible alarm so that it can be seen and heard on the vessel where cargo transfer is controlled and in the cargo deck area; and

(4) Activate an alarm early enough to allow the person in charge of transfer operations to stop the cargo transfer before the tank overflows.

(e) If a spill valve is installed on a cargo tank fitted with a vapor collection system, it must meet the requirements of 46 CFR 39.2009(c).

(f) If a rupture disk is installed on a cargo tank fitted with a vapor collection system, it must meet the requirements of 46 CFR 39.2009(d).

§ 39.2009 Tank barge liquid overfill protection—B/ALL.

(a) Each cargo tank of a tank barge must have one of the following liquid overfill protection arrangements:

(1) A system meeting the requirements of 46 CFR 39.2007 that—

(i) Includes a self-contained power supply;

(ii) Is powered by generators on the barge; or

(iii) Receives power from a facility and is fitted with a shore tie cable and a 120-volt, 20-ampere explosion-proof plug that meets—

(A) NEMA WD–6 (incorporated by reference, *see* 46 CFR 39.1005);

(B) NFPA 70, Articles 410–57 and 501–12 (incorporated by reference, *see* 46 CFR 39.1005); and

(C) 46 CFR 111.105–9;

(2) An intrinsically safe overfill control system that—

(i) Is independent of the cargo-gauging device required by 46 CFR 39.2003(a);

(ii) Activates an alarm and automatic shutdown system at the facility overfill control panel 60 seconds before the tank is 100 percent liquid-full during a facility-to-vessel cargo transfer;

(iii) Activates an alarm and automatic shutdown system on the vessel receiving cargo 60 seconds before the tank is 100 percent liquid-full during a vessel-to-vessel cargo transfer;

(iv) Can be inspected at the tank for proper operation prior to each loading;

(v) Consists of components that, individually or in series, will not generate or store a total of more than 1.2 volts (V), 0.1 amperes (A), 25 megawatts (MW), or 20 microJoules (μJ);

(vi) Has at least one tank overfill sensor switch per cargo tank that is designed to activate an alarm when its normally closed contacts are open;

(vii) Has all tank overfill sensor switches connected in series;

(viii) Has interconnecting cabling that meets 46 CFR 111.105–11(b) and (d), and 46 CFR 111.105–17(a); and

(ix) Has a male plug with a five-wire, 16–A connector body meeting IEC 60309–1 and IEC 60309–2 (both incorporated by reference, *see* 46 CFR 39.1005), that is—

(A) Configured with pins S2 and R1 for the tank overfill sensor circuit, pin G connected to the cabling shield, and pins N and T3 reserved for an optional high-level alarm circuit meeting the requirements of this paragraph; and

(B) Labeled "Connector for Barge Overflow Control System" and labeled with the total inductance and capacitance of the connected switches and cabling;

(3) A spill valve that meets ASTM F1271 requirements (incorporated by reference, *see* 46 CFR 39.1005), and—

(i) Relieves at a predetermined pressure higher than the pressure at which the pressure relief valves meeting the requirements of 46 CFR 39.2011 operate;

(ii) Limits the maximum pressure at the top of the cargo tank during liquid overfill to not more than the maximum design working pressure for the tank when at the maximum loading rate for the tank; and

(iii) Has a means to prevent opening due to cargo sloshing while the vessel is in ocean or coastwise service; or

(4) A rupture disk arrangement that meets paragraphs (a)(3)(i), (a)(3)(ii), and (a)(3)(iii) of this section and is approved by the Commandant.

(b) A tank barge authorized to carry a cargo having toxic properties, meaning they are listed in 46 CFR Table 151.05 with the "Special requirements" column referring to 46 CFR 151.50–5, must comply with the requirements of 46 CFR 39.2001(l).

§ 39.2011 Vapor overpressure and vacuum protection—TB/ALL.

(a) The cargo tank venting system required by 46 CFR 32.55 must—

(1) Be capable of discharging cargo vapor at the maximum transfer rate plus the vapor growth for the cargo such that the pressure in the vapor space of each tank connected to the vapor control system (VCS) does not exceed—

(i) The maximum design working pressure for the tank; or

(ii) If a spill valve or rupture disk is fitted, the pressure at which the device operates;

(2) Relieve at a pressure corresponding to a pressure in the cargo tank vapor space not less than 1.0 pounds per square inch gauge (psig);

(3) Prevent a vacuum, which generates in any tank connected to the vapor collection system during the withdrawal of cargo or vapor at maximum rates, in a cargo tank vapor space from exceeding the maximum design vacuum; and

(4) Not relieve at a vacuum corresponding to a vacuum in the cargo tank vapor space between 14.7 pounds per square inch absolute (psia) (0 psig) and 14.2 psia (−0.5 psig).

(b) Each pressure-vacuum relief valve must—

(1) Be of a type approved under 46 CFR 162.017, for the pressure and vacuum relief setting desired;

(2) Be tested for venting capacity in accordance with paragraph 1.5.1.3 of API 2000 (incorporated by reference, *see* 46 CFR 39.1005). The test must be carried out with a flame screen fitted at the vacuum relief opening and at the discharge opening if the pressure-vacuum relief valve is not designed to ensure a minimum vapor discharge velocity of 30 meters (98.4 feet) per second; and

(3) If installed after July 23, 1991, have a mechanism to check that it operates freely and does not remain in the open position.

(c) A liquid filled pressure-vacuum breaker may be used for vapor overpressure and vacuum protection subject to Commandant approval.

(d) Vapor growth must be calculated using a method approved by the Marine Safety Center.

§ 39.2013 High and low vapor pressure protection for tankships—T/ALL.

Each tankship with a vapor collection system must be fitted with a pressure-sensing device, located as close as practicable to the vessel vapor connection, that measures the pressure in the main vapor collection line, which—

(a) Has a pressure indicator located on the tankship where the cargo transfer is controlled; and

(b) Has a high-pressure and a low-pressure alarm that—

(1) Gives an audible and a visible warning on the vessel where the cargo transfer is controlled;

(2) Activates an alarm when the pressure-sensing device measures a high pressure of not more than 90 percent of the lowest pressure relief valve setting in the cargo tank venting system; and

(3) Activates an alarm when the pressure-sensing device measures a low pressure of not less than 0.144 pounds per square inch gauge (psig) for an inerted tankship, or the lowest vacuum relief valve setting in the cargo tank venting system for a non-inerted tankship.

§ 39.2014 Polymerizing cargoes safety—TB/ALL.

(a) Common vapor headers for polymerizing cargoes must be constructed with adequate means to permit internal examination of vent headers.

(b) Vapor piping systems and pressure-vacuum valves that are used for polymerizing cargoes must be inspected internally at least annually.

(c) Pressure-vacuum valves and spill valves which are used for polymerizing cargoes must be tested for proper movement prior to each transfer.

§ 39.2015 Tank barge pressure-vacuum indicating device—B/ALL.

A fixed pressure-indicating device must be installed as close as practicable to the vessel vapor connection on a tank barge with a vapor collection system. The indicating device must measure the pressure vacuum in the main vapor collection line and have a pressure indicator located where the cargo transfer is controlled.

Subpart 39.3000—Vapor Collection Operations During Cargo Transfer

§ 39.3001 Operational requirements for vapor control systems during cargo transfer—TB/ALL.

(a) Vapor from a tank vessel may not be transferred to a facility in the United States, or vapor from a facility storage tank may not be transferred to a tank vessel, unless the facility's marine vapor control system (VCS) is certified by a certifying entity as meeting the requirements of 33 CFR part 154, subpart P and the facility's facility operations manual is marked by the local Coast Guard Captain of the Port (COTP) as required by 33 CFR 154.325(d).

(b) Vapor from a tank vessel may not be transferred to a vessel that does not have its certificate of inspection or certificate of compliance endorsed as meeting the requirements of this part and for controlling vapor of the cargo being transferred.

(c) For each cargo transferred using a vapor collection system, the pressure drop through the vapor collection system from the most remote cargo tank to the vessel vapor connection, including vapor hoses if used by the vessel, must be—

(1) Calculated at the maximum transfer rate and at lesser transfer rates;

(2) Calculated using a density estimate for the cargo vapor and air mixture, or vapor and inert gas mixture, based on a partial pressure (partial molar volumes) method for the mixture, assuming ideal gas law conditions;

(3) Calculated using a vapor growth rate as stated in 46 CFR 39.2011(d) for the cargo being transferred; and

(4) Included in the vessel's transfer procedures as a table or graph, showing the liquid transfer rate versus the pressure drop.

(d) The rate of cargo transfer must not exceed the maximum allowable transfer rate as determined by the lesser of the following:

(1) 80 percent of the total venting capacity of the pressure relief valves in the cargo tank venting system when relieving at the set pressure;

(2) The total vacuum relieving capacity of the vacuum relief valves in the cargo tank venting system when relieving at the set pressure; and

(3) For a given pressure at the facility vapor connection, or if vessel-to-vessel transfer at the vapor connection of the service vessel, then the rate based on

pressure drop calculations at which the pressure in any cargo tank connected to the vapor collection system exceeds 80 percent of the setting of any pressure relief valve in the cargo tank venting system.

(e) Cargo tanks must not be filled higher than—

(1) 98.5 percent of the cargo tank volume; or

(2) The level at which an overfill alarm complying with 46 CFR 39.2007 or 39.2009(a)(2) is set.

(f) A cargo tank should remain sealed from the atmosphere during cargo transfer operations. The cargo tank may only be opened temporarily for gauging or sampling while the tank vessel is connected to a VCS as long as the following conditions are met:

(1) The cargo tank is not being filled or no vapor is being transferred into the cargo tank;

(2) For cargo loading, any pressure in the cargo tank vapor space is first reduced to atmospheric pressure by the VCS, except when the tank is inerted;

(3) The cargo is not required to be closed or restricted gauged by 46 CFR part 151, Table 151.05 or part 153, Table 1; and

(4) For static accumulating cargo, all metallic equipment used in sampling or gauging must be electrically bonded to the vessel and remain bonded to the vessel until it is removed from the tank, and if the tank is not inerted, 30 minutes must have elapsed after any cargo transfer to the tank is stopped, before the equipment is put into the tank.

(g) For static accumulating cargo, the initial transfer rate must be controlled in accordance with OCIMF ISGOTT Section 11.1.7 (incorporated by reference, *see* 46 CFR 39.1005), in order to minimize the development of a static electrical charge.

(h) If cargo vapor is collected by a facility that requires the vapor from the vessel to be inerted in accordance with 33 CFR 154.2105, the oxygen content in the vapor space of each cargo tank connected to the vapor collection system must not exceed 60 percent by volume of the cargo's minimum oxygen concentration for combustion (MOCC), or 8 percent by volume for vapor of crude oil, gasoline blends, or benzene, at the start of cargo transfer. The oxygen content of each tank, or each area of a tank formed by each partial bulkhead, must be measured at a point 1.0 meter (3.28 feet) below the tank top and at a point equal to one-half of the ullage.

(i) If the vessel is equipped with an inert gas system, the isolation valve required by 46 CFR 39.2001(e) must remain closed during vapor transfer.

(j) Unless equipped with an automatic self-test and circuit-monitoring feature, each high-level alarm and tank overfill alarm on a cargo tank being loaded, required by 46 CFR 39.2007 or 39.2009, must be tested at the tank for proper operation within 24 hours prior to the start of cargo transfer.

Subpart 39.4000—Vessel-to-Vessel Transfers Using Vapor Balancing

§ 39.4001 General requirements for vapor balancing—TB/ALL.

(a) Vessels using vapor balancing while conducting a vessel-to-vessel transfer operation, directly or through a shore loop, must meet the requirements of this subpart in addition to the requirements of 46 CFR part 39, subparts 39.1000, 39.2000, and 39.3000. Arrangements other than vapor balancing used to control vapor emissions during a vessel-to-vessel transfer operation must receive approval from the Commandant.

(b) A vapor balancing operation must receive approval from the Commandant to use a compressor or blower to assist vapor transfer.

(c) Vapor balancing is prohibited when the cargo tanks on a vessel discharging cargo are inerted and the cargo tanks on a vessel receiving cargo are not inerted.

(d) A vessel that intends to collect vapors (during a vessel-to-vessel transfer operation) from cargoes not previously approved must receive specific approval from the Commandant before beginning transfer operations.

§ 39.4003 Design and equipment for vapor balancing—TB/ALL.

(a) During transfer operations, if the cargo tanks are inerted on a vessel discharging cargo to a receiving vessel with inerted cargo tanks, the service vessel must—

(1) Inert the vapor transfer hose prior to transferring cargo vapor; and

(2) Have an oxygen analyzer with a sensor or sampling connection fitted within 3 meters (9.74 feet) of the vessel vapor connection that—

(i) Activates a visible and an audible alarm on the service vessel where cargo transfer is controlled when the oxygen content in the vapor collection system exceeds 60 percent by volume of the cargo's minimum oxygen concentration for combustion (MOCC), or 8 percent by volume for vapor of crude oil, gasoline blends, or benzene;

(ii) Has an oxygen concentration indicator located on the service vessel where the cargo transfer is controlled; and

(iii) Has a connection for injecting a span gas of known concentration for calibration and testing of the oxygen analyzer.

(b) If the cargo tanks are not inerted on a vessel discharging cargo during transfer operations, and the cargo is flammable or combustible, the vapor collection line on the service vessel must be fitted with a detonation arrester that meets the requirements of 33 CFR 154.2106, and be located within 3 meters (9.74 feet) of the vessel vapor connection.

(c) An electrical insulating flange or one length of non-conductive hose must be provided between the vessel vapor connection on each vessel operating a vessel-to-vessel cargo transfer.

§ 39.4005 Operational requirements for vapor balancing—TB/ALL.

(a) During a vessel-to-vessel transfer operation, each cargo tank being loaded must be connected by the vapor collection system to a cargo tank that is being discharged.

(b) If the cargo tanks on both the vessel discharging cargo and the vessel receiving cargo are inerted, the following requirements must be met:

(1) Each tank on a vessel receiving cargo, which is connected to the vapor collection system, must be tested prior to cargo transfer to ensure that the oxygen content in the vapor space does not exceed 60 percent by volume of the cargo's minimum oxygen concentration for combustion (MOCC), or 8 percent by volume for vapor of crude oil, gasoline blends, or benzene. The oxygen content of each tank, or each area of a tank formed by each partial bulkhead, must be measured at a point 1 meter (3.28 feet) below the tank top and at a point equal to one-half of the ullage;

(2) Prior to starting transfer operations, the oxygen analyzer required by 46 CFR 39.4003(a) must be tested for proper operation;

(3) During transfer operations the oxygen content of vapors being transferred must be continuously monitored;

(4) Cargo transfer must be terminated if the oxygen content exceeds 60 percent by volume of the cargo's MOCC, or 8 percent by volume for vapor of crude oil, gasoline blends, or benzene;

(5) Transfer operations may resume once the oxygen content in the tanks of the vessel receiving cargo is reduced to 60 percent by volume or less of the cargo's MOCC, or 8 percent by volume or less for vapor of crude oil, gasoline blends, or benzene; and

(6) Prior to starting vapor transfer operations, the vapor transfer hose must be purged of air and inerted.

(c) The isolation valve located on the service vessel required by 46 CFR

39.2001(g) must not be opened until the pressure in the vapor collection system on the vessel receiving cargo exceeds the pressure in the vapor collection system on the vessel discharging cargo.

(d) The vessel discharging cargo must control the cargo transfer rate so that the transfer rate does not exceed—

(1) The authorized maximum discharge rate of the vessel discharging cargo;

(2) The authorized maximum loading rate of the vessel receiving cargo; or

(3) The processing rate of the approved vessel vapor processing system, if one is used to process the vapor collected during the transfer operations.

(e) The pressure in the vapor space of any cargo tank connected to the vapor collection line on either the vessel receiving cargo or the vessel discharging cargo must not exceed 80 percent of the lowest setting of any pressure relief valve during ballasting or cargo transfer.

(f) Impressed current cathodic protection systems must be de-energized during cargo transfer operations.

(g) Tank washing is prohibited unless the cargo tanks on both the vessel discharging cargo and the vessel receiving cargo are inerted, or the tank is isolated from the vapor collection line.

Subpart 39.5000—Multi-breasted Loading Using a Single Facility Vapor Connection

§ 39.5001 General requirements for multi-breasted loading—B/CLBR.

(a) Each barge must be owned and operated by the same entity and must have an approved vapor control system (VCS).

(b) The crossover vapor hose must—

(1) Be marked in accordance with 46 CFR 39.2001(h);

(2) Meet the qualifications of 46 CFR 39.2001(i);

(3) Not extend more than 7.62 meters (25 feet) between two barges during transfer operations; and

(4) Have a diameter at least as large as the diameter of the largest pipe in the VCS on the outboard barge.

(c) The hazards associated with barge-to-barge or barge-to-shore electric currents must be controlled in accordance with sections 11.9 or 17.5 of OCIMF ISGOTT (incorporated by reference, *see* 46 CFR 39.1005).

(d) The cargo transfer procedures must reflect the procedures to align and disconnect a facility VCS to and from an inboard barge, and alternately, to and from an outboard barge through the vapor cross-over hose and the inboard barge's vapor header, or "dummy" header. This must include proper connections for the facility VCS's alarm/shutdown system to the alarm/shutdown system of the barge being loaded at the time.

(e) Barge owners and operators must comply with any additional operational requirements imposed by the local Captain of the Port (COTP) in whose zone the shore facility is located. The barge owner or operator must identify the specific facilities at which a multi-breasted loading operation will be conducted and provide the Commandant with a list of these facilities. These facilities must be certified for conducting such an operation.

§ 39.5003 Additional requirements for multi-breasted loading using an inboard barge vapor collection system—B/CLBR.

(a) Each barge must have at least one liquid overfill protection system that fulfills the requirements of 46 CFR 39.2009.

(b) The vapor header of an inboard barge that is used during outboard barge loading must—

(1) Be aligned with the vapor header of the outboard barge;

(2) Have a diameter at least as large as the diameter of the largest pipe in the vapor collection system of the outboard barge; and

(3) Be marked in accordance with 46 CFR 39.2001(h).

(c) A licensed tankerman, trained in and familiar with multi-breasted loading operations, must be onboard each barge during transfer operations. The tankerman serves as the barge person-in-charge (PIC). During transfer operations, the barge PICs must maintain constant communication with each other as well as with the facility PIC.

(d) If multi-breasted loading will be conducted using more than one liquid transfer hose from the shore facility, the facility must be capable of activating the emergency shutdown system required by 33 CFR 154.550. This will automatically stop the cargo flow to each transfer hose simultaneously, in the event an upset condition occurs that closes the remotely operated cargo vapor shutoff valve in the facility's vapor control system. Multi-breasted loading is prohibited unless the shore facility can comply with this requirement.

§ 39.5005 Additional requirements for multi-breasted loading using a "dummy" vapor header–B/CLBR.

(a) Each inboard barge "dummy" header used during outboard barge loading must—

(1) Be aligned with the vapor header of the outboard barge;

(2) Have a diameter at least as large as the diameter of the largest pipe in the vapor collection system of the outboard barge;

(3) Be marked in accordance with 46 CFR 39.2001(h); and

(4) Meet the same design and installation requirements for the vapor collection piping onboard the same barge.

(b) Flanges must meet the same design and installation requirements for flanges in the vapor collection system onboard the same barge.

(c) A stud must be permanently attached, as required in 46 CFR 39.2001(j), to the vapor connection flange on the "dummy" header.

Subpart 39.6000—Tank Barge Cleaning Operations with Vapor Collection

§ 39.6001 Design and equipment of vapor collection and stripping systems—B/ALL.

(a) Each barge engaged in cleaning operations at an approved cleaning facility must have a conductive fixed stripping line installed in each cargo tank. The line must extend to the low point of each cargo tank, extend through and be welded to the top of the cargo tank, and terminate above deck with a full port valve plugged at the open end.

(b) An existing fixed stripping system may be used instead of the stripping line required in paragraph (a) of this section.

(c) Each stripping line must be labeled at an on-deck location with the words "Stripping Line-Tank," followed by the tank's number, name, or location.

(d) Vapors may be collected from the barge's cargo tanks through a common fixed vapor header, through the fixed liquid cargo header, or through flanged flexible hoses located at the top of each cargo tank.

(e) The vapor collection system must not interfere with the proper operation of the cargo tank venting system.

(f) A barge being gas-freed by a fluid displacement system must fulfill the following requirements:

(1) If the fluid medium is a compressible fluid, such as inert gas, it must be injected into the barge's cargo tanks through a common fixed vapor header, through the fixed liquid cargo header, or through flanged flexible hoses located at the top of each cargo tank;

(2) If the fluid medium is a non-compressible fluid, such as water, it must be injected into the barge's cargo tanks through the fixed liquid cargo header only; and

(3) If the fluid medium is a non-compressible fluid, such as water, the barge must be equipped with a liquid

overfill protection arrangement and fulfill the requirements for tank barge liquid overfill protection contained in 46 CFR 39.2009.

(g) The barge vapor connection must be electrically insulated from the facility vapor connection and the fluid injection connection must be electrically insulated from the fluid injection source, if fitted, in accordance with OCIMF ISGOTT section 17.5 (incorporated by reference, *see* 46 CFR 39.1005).

(h) Vapor collection piping must be electrically bonded to the barge hull and must be electrically continuous.

(i) All equipment used on the barge during cleaning operations must be electrically bonded to the barge and tested to ensure electrical continuity prior to each use.

(j) Hoses used for the transfer of vapors during cleaning operations must meet the requirements of 46 CFR 39.2001(i) and have markings as required in 46 CFR 39.2001(h).

(k) Hoses used for the transfer of liquids during cleaning operations must—

(1) Have a designed burst pressure of at least 600 pounds per square inch gauge (psig);

(2) Have a maximum allowable working pressure of at least 150 psig;

(3) Be capable of withstanding at least the maximum vacuum rating of the cleaning facility's vapor-moving device without collapsing or constricting;

(4) Be electrically continuous with a maximum resistance of 10,000 ohms;

(5) Have flanges with a bolthole arrangement complying with the requirements for 150 pound class ANSI B16.5 flanges (incorporated by reference, *see* 46 CFR 39.1005); and

(6) Be abrasion and kinking resistant and compatible with the liquids being transferred.

(l) If a hose is used to transfer either vapor or liquid from the barge during cleaning operations, hose saddles that provide adequate support to prevent the collapse or kinking of hoses must accompany hose handling equipment.

§ 39.6003 Underpressure protection during stripping and gas-freeing operations—B/ALL.

(a) The cargo tank venting system required by 46 CFR 32.55 must not exceed the maximum design working pressure or the maximum design vacuum for the cargo tank.

(b) Each barge must be fitted with a means for connecting the pressure-sensing and pressure-indicating devices required by 33 CFR 154.2203 on each cargo tank top. The valve connection point must be labeled "Pressure Sensor Connection".

(c) For stripping operations with closed cargo tanks, the maximum stripping rate must not exceed the volumetric flow capacity of the vacuum relief valve protecting the cargo tank.

§ 39.6005 Inspection prior to conducting gas-freeing operations—B/ALL.

(a) The following inspections must be conducted by the barge person in charge prior to commencing gas-freeing operations, and show that—

(1) Each part of the barge's vapor collection system is aligned to allow vapor to flow to a cleaning facility's vapor control system (VCS);

(2) If a fluid displacement system is used to conduct gas-freeing operations—

(i) The fluid supply line is connected to the fluid injection connection; and

(ii) The maximum fluid injection rate is determined in accordance with 46 CFR 39.6007(c)(2);

(3) The maximum stripping or gas-freeing rate is determined in accordance with 46 CFR 39.6003(c) or 39.6007(c), respectively, and adequate openings required by 46 CFR 39.6007(c)(1) are available and identified;

(4) The pressure-sensing and pressure-indicating devices required by 33 CFR 154.2203 are connected as required by 46 CFR 39.6003(b);

(5) The maximum and minimum operating pressures of the barge being cleaned are determined;

(6) Unrepaired loose covers, kinks, bulges, gouges, cuts, slashes, soft spots, or any other defects which would permit the discharge of vapors through the vapor recovery hose material must be detected during inspection and repaired prior to operation;

(7) The facility vapor connection is electrically insulated from the barge vapor connection and the fluid injection connection is electrically insulated from the fluid injection source, if fitted, in accordance with OCIMF ISGOTT section 17.5 (incorporated by reference, *see* 46 CFR 39.1005); and

(8) All equipment is bonded in accordance with 46 CFR 39.6001(h).

§ 39.6007 Operational requirements for tank barge cleaning—B/ALL.

(a) During cleaning operations, vapors from a tank barge cannot be transferred to a cleaning facility which does not have a marine vapor control system (VCS) certified by a certifying entity, and its facility operations manual endorsed by the Captain of the Port (COTP) as meeting the requirements of 33 CFR part 154, subpart P.

(b) Prior to commencing stripping operations, the maximum allowable stripping rate must be determined. The maximum allowable stripping rate must not exceed the volumetric flow capacity of the vacuum relief valve protecting the cargo tank.

(c) The maximum gas-freeing rate is determined by the following:

(1) For a vacuum displacement system:

(i) The maximum allowable gas-freeing rate is a function of the area open to the atmosphere for the cargo tank being gas-freed. The area open to the atmosphere must be large enough to maintain the pressure in the cargo tank being gas-freed at or above 14.5 pounds per square inch absolute (psia) (-0.2 pounds per square inch gauge (psig));

(ii) The maximum allowable gas-freeing rate must be calculated from Table 1 of this section, using the area open to the atmosphere for the cargo tank being gas-freed as the entering determination;

(2) For a fluid displacement system, the maximum allowable gas-freeing rate is determined by the lesser of the following:

(i) Eighty percent of the total venting capacity of the pressure relief valve in the cargo tank venting system when relieving at its set pressure;

(ii) Eighty percent of the total vacuum relieving capacity of the vacuum relief valve in the cargo tank venting system when relieving at its set pressure; or

(iii) The rate based on pressure drop calculations at which, for a given pressure at the facility vapor connection, the pressure in the cargo tank being gas-freed exceeds 80 percent of the setting of any pressure relief valve in the cargo tank venting system.

(d) Any hatch and/or fitting used to calculate the minimum area required to be open to the atmosphere must be opened and secured in such a manner as to prevent accidental closure during gas freeing. All flame screens for the hatch and/or fitting opened must be removed in order to allow for maximum airflow. The hatch and/or fitting must be secured open before the pressure in the cargo tank falls below 10 percent of the highest setting of any of the barge's vacuum relief valves.

(e) "Do Not Close Hatch/Fitting" signs must be conspicuously posted near the hatch and/or fitting opened during gas-freeing operations.

(f) To minimize the dangers of static electricity, all equipment used on the barge during gas-freeing and cleaning operations must be electrically bonded to the barge and tested to ensure electrical continuity before each use.

(g) If the barge is equipped with an inert gas system, the inert gas main isolation valve must remain closed during cleaning operations.

(h) Vapors from incompatible cargoes that are collected simultaneously must be kept separated throughout the barge's entire vapor collection system. Chemical compatibility must be determined in accordance with the procedures contained in 46 CFR 150, part A.

TABLE 1 TO § 39.6007—MINIMUM OPEN AREA FOR BARGE CLEANING HATCHES

Air flow (CFM) (cubic feet/minute)	Air flow (CFS) (cubic feet/second)	Open area (square inches)	Diameter opening (inches)	Square opening (inches)
500	8.3	10.7	3.7	3.3
600	10.0	12.8	4.0	3.6
700	11.7	15.0	4.4	3.9
800	13.3	17.1	4.7	4.1
900	15.0	19.3	5.0	4.4
1000	16.7	21.4	5.2	4.6
1100	18.3	23.6	5.5	4.9
1200	20.0	25.7	5.7	5.1
1300	21.7	27.8	6.0	5.3
1400	23.3	30.0	6.2	5.5
1500	25.0	32.1	6.4	5.7
1600	26.7	34.3	6.6	5.9
1700	28.3	36.4	6.8	6.0
1800	30.0	38.5	7.0	6.2
1900	31.7	40.7	7.2	6.4
2000	33.3	42.8	7.4	6.5
2100	35.0	45.0	7.6	6.7
2200	36.7	47.1	7.7	6.9
2300	38.3	49.3	7.9	7.0
2400	40.0	51.4	8.1	7.2
2500	41.7	53.5	8.3	7.3
2600	43.3	55.7	8.4	7.5
2700	45.0	57.8	8.6	7.6
2800	46.7	60.0	8.7	7.7
2900	48.3	62.1	8.9	7.9
3000	50.0	64.2	9.0	8.0
3100	51.7	66.4	9.2	8.1
3200	53.3	68.5	9.3	8.3
3300	55.0	70.7	9.5	8.4
3400	56.7	72.8	9.6	8.5
3500	58.3	75.0	9.8	8.7
3600	60.0	77.1	9.9	8.8
3700	61.7	79.2	10.0	8.9
3800	63.3	81.4	10.2	9.0
3900	65.0	83.5	10.3	9.1
4000	66.7	85.7	10.4	9.3

§ 39.6009 Barge person in charge: Designation and qualifications—B/ALL.

The designation and qualification requirements contained in 33 CFR 155.700 and 33 CFR 155.710(a)(2) apply to the barge person in charge.

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